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ORIGINAL ARTICLES.

A STUDY OF THE BLOOD AFTER HEMORRHAGE, AND A COMPARATIVE STUDY OF ARTERIAL AND VENOUS BLOOD, WITH REFERENCE TO THE NUMBER OF CORPUSCLES AND THE AMOUNT OF HEMOGLOBIN.

BY GUY L. KIEFER, M.D.,
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IT has been considered a fact that venous blood contains a greater number of corpuscles and a larger amount of hemoglobin than does arterial blood, but this statement has been contradicted recently by Cohnstein and Zuntz, who maintain that there is no such difference, and that the results obtained by previous investigators were due to the venous stasis caused by their experiments. The work of Cohnstein and Zuntz shows, as an average of eleven arterial determinations, 5,307,100 corpuscles per c.mm., and as an average of twelve venous estimations 5,191,600 corpuscles per c.mm. In order, if possible, to throw more light on this subject, I have made a number of experiments, the results of which will be seen in this paper.

Most of my experiments were limited to one mammal—the cat—in order that by confining the work to one kind of animal I might gain a certain degree of familiarity with the peculiarities of its blood, and thus obtain better results.

For the estimation of the percentage of hemoglobin in the blood, Gowers's hemoglobinometer was used, and for the determination of the number of corpuscles Malassez's hemocytometer, as made by Verick in 1883, with a 3 per cent. solution of sodium sulphate (sp. gr. 1025) as the diluting fluid. I made a number of estimates of normal human blood, with the following results: As a mean of five estimates on various men, 4,560,000 corpuscles and 90 per cent. of hemoglobin were obtained with the instruments used, and as a mean of four estimates of my own blood taken at different times, 4,800,000 corpuscles and 95 per cent. of hemoglobin. As a mean of twenty-one estimates on cats I obtained 6,646,000 corpuscles per c.mm. of blood, and 80 per cent. of hemoglobin. Blood for examination in the case of a cat was taken from the ear.

For the comparative study of arterial and venous blood two methods of procedure were employed.

1. An artery and its corresponding vein were laid bare for some distance, two ligatures applied simultaneously to each, and then the piece enclosed between the ligatures was removed, and the blood contained in it examined. Due care was taken to dry the outside of each vessel, so that only the particular kind of blood desired was obtained.

2. An artery and its corresponding vein were laid bare, and a little blood taken from each (without applying any ligatures) by means of a hypodermatic syringe. Care was taken to clean and dry the instrument thoroughly before each estimation.

By these methods the circulation was not interfered with. During all the experiments the cats (or other animals) were kept tied down, and anesthetized with ether. Inasmuch as I had but one hemocytometer and hemoglobinometer at my disposal, I could make but one determination at a time, but the other was made as soon as possible thereafter; and in order to counteract the difference that might be brought about by this circumstance, I examined the vein first in some experiments, and the artery in others.

Seven experiments were made, with the following results: In all of the experiments, except one, there was a slight difference in favor of the vein, and the average of all the experiments showed a difference of 60,000 corpuscles per c.mm., and less than 1 per cent. (0.33) of hemoglobin, in favor of the vein; but in determinations of this kind this slight variation is within the limits of error. My experiments would lead me to believe, therefore, that there is very little or no difference in the amount of hemoglobin and the number of corpuscles in the arterial and venous blood, and that the large differences usually reported are due to interference with the venous circulation, as claimed by Cohnstein and Zuntz. But in order to be convinced on this point, I made a number of experiments for the estimation of the venous blood before and after ligating the vein, *i. e.*, before and after interference with the circulation.

The methods of obtaining the blood were the same as those employed in the first set of experiments, viz., by taking out a piece of the vein, and by means of the hypodermatic syringe. In cases in which the latter method was employed the vein was laid bare, and a drop of blood taken by means of the syringe and examined. Then the vein was ligated, and a short time afterward a drop of blood was

taken on the peripheral side of the ligature and examined. In cases in which the former method was used the vein was laid bare, and two ligatures were applied simultaneously. After ligating the vein again, on the peripheral side of the section just isolated, the piece was removed, cleaned, and examined as before. After a short time another ligature was applied to the peripheral side of the one last made, and this piece was also taken out and examined. By these two methods I was enabled to get satisfactory samples of venous blood before and after venous stasis had been produced. In these experiments I ascertained simply the number of corpuscles in order to facilitate the work, and as the amount of hemoglobin is in proportion to the number of corpuscles, an estimation of it seemed unnecessary.

All of my experiments (eight in number) show a considerable increase in the number of corpuscles after ligating, the difference in one case being over a million. The average of all the experiments made shows an increase of 537,500 corpuscles per c.mm. after ligating, and we may conclude, therefore, that the large differences found by previous workers were due to this cause.

A study of the regeneration of the blood after hemorrhage involves a consideration of two other questions, viz.: 1. Are the amount of hemoglobin and the number of corpuscles diminished in proportion to the amount of blood lost, *e. g.*, after a hemorrhage of 100 c.cm. of blood will the diminution in the amount of hemoglobin and the number of corpuscles be twice as great as after a hemorrhage of fifty c.cm. of blood? 2. Are the amount of hemoglobin and the number of corpuscles always in proportion to each other after hemorrhage, *i. e.*, during the entire period of regeneration?

In all of my experiments the animals were bled from the carotid artery. An ordinary glass canula, of as large a caliber as possible, was used, and the blood allowed to flow quite rapidly. In some cases, when the hemorrhages were very severe, a quantity of normal saline solution was injected hypodermatically immediately after the blood had been drawn. None of my observations were made immediately after the hemorrhage. Twenty-four hours were allowed to pass in each case before making an estimation. The blood for examination was taken from the ear by clipping it very slightly. In each case there was a diminution in the amount of hemoglobin and the number of corpuscles twenty-four hours after the hemorrhage, and this diminution was found to be substantially in proportion to the amount of blood taken. For example, in the case of the slightest hemorrhage that was produced (2.1 per cent. of the body-weight), the amount of hemoglobin was reduced to 52.85 per cent. of the normal, and the number of corpuscles was reduced to 61.8 per cent. of the original number; while in the case of the largest hemorrhage (3.04 per cent. of the body-weight), the amount of hemoglobin was reduced to 46.6 per cent., and the number of corpuscles to 48.7 per cent. of the normal, and the same relation existed in each case. Whether or not the same result is obtained when the hemorrhages are less severe was not determined. From the results just given it would appear that in each case after hemorrhage the diminution in the amount of hemoglobin is greater than that in the number of corpuscles, but this is not necessarily the case. My first estimations after the hemorrhage showed in some animals an equal diminution in the amount of hemoglobin and the number of corpuscles, while in other cases the diminution in the amount of hemoglobin was the greater.

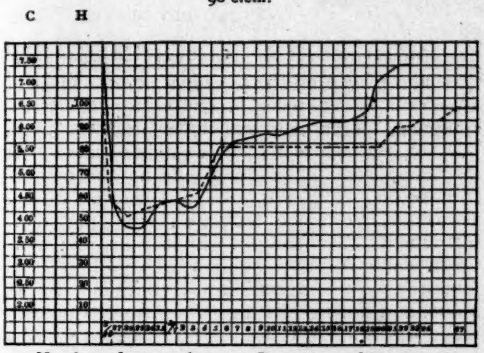
With reference to the second question, it will appear from the curves of regeneration that in each case it took a longer time for the amount of hemoglobin to return to normal than for the number of corpuscles. From this circumstance we may conclude that after hemorrhage the amount of hemoglobin is not always in proportion to the number of corpuscles, and probably for the reason that the new corpuscles are formed more quickly and in greater quantity, and consequently contain less hemoglobin, than the normal.

For the study of the time of regeneration of the blood daily estimations were made after the hemorrhage, and the data so obtained were used to construct curves of regeneration. In each case the animal was bled, as described, and was fed on milk and meat during the regeneration. The animals were studied one at a time, as far as possible, and were kept in a large cage, with plenty of air and light.

From the curves constructed from the experiments it appears that the diminution in the number of corpuscles, and in the amount of hemoglobin, continues for a number of days after the hemorrhage, reaching its minimum in from two to seven days, after which there is a steady rise to normal in the case of the corpuscles, but in the case of the hemoglobin the curve is somewhat different. During the period of fall and the first portion of the period of rise the hemoglobin and corpuscle curves are very similar; then for some time the hemoglobin lags behind the corpuscles until nearly the time when the corpuscles are restored to normal, when it takes a sudden rise and reaches normal somewhat later than the corpuscles. The specimen curve given in the accompanying figure illustrates very well the two peculiarities described. The entire time of regeneration was found to vary from twenty-one to thirty-four days. My experiments confirm the

results reached by former investigators. Otto found that the minimum diminution was reached in from one to five days, and that the time of regeneration varied from seven to twenty-five days. Hünerfauth (Heidelberg) found that the minimum was reached in from one to nine days, and the normal in from fourteen to twenty-two days. According to Buntzen the number of corpuscles is reduced after hemorrhage, and reaches its minimum in from one to eleven days, and the entire period of regeneration, according to this author, varies from

EXPERIMENT No. 6. Cat: weight, 3628 grams. Hemorrhage, 90 c.cm.



C. Number of corpuscles. H. Percentage of hemoglobin.

Curve showing the regeneration of the red corpuscles and of the hemoglobin after hemorrhage. The experiment was made upon an unusually vigorous animal, so that the regeneration was more rapid than in most of the experiments. The full line gives the curve for the corpuscles, and the dotted line that for the hemoglobin. Observations were made at intervals of twenty-four hours from the 26th of March to the 27th of April.

nine to thirty-five days. There does not seem to be any explanation given for the continued diminution of the number of blood-elements during the first days after hemorrhage. Leaving aside mere variations in the amount of blood-plasma, two possible explanations have suggested themselves to me. The continued sinking in the number of corpuscles and in the amount of hemoglobin after hemorrhage may be due to the fact that the consumption of blood-corpuscles during this time is greater than the regeneration, owing to some acceleration in the body-metabolisms, or possibly there may be a scarcity of material for the manufacture of new corpuscles, so that after the first output of corpuscles from the hematopoietic organs, brought about by the anemia, the reserve supply is depleted to such an extent that for some days the production of new red corpuscles is smaller than it was immediately after the hemorrhage. This latter hypothesis is one that may be tested directly by examinations of the marrow; experiments of this kind may be made later in this laboratory.

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HEMOPHILIA.

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I WISH to place on record some cases of hemophilia in a family of bleeders, that, so far as I can learn, are not connected with any of the bleeder families hitherto reported. They occurred in the family of Charles Denner, a German-American farmer living in Campbell County, Ky., six miles south of Newport.

Denner is fifty-six years old. He was born in Bavaria, but came to this country when quite a young man. He married in Campbell County, Ky., and twenty-nine years ago settled on the farm he now occupies. He has four brothers and one sister, and they are living in this country. If there was any hemophilia in their ancestors, they know nothing of it. They never heard of the disease until it developed in this family. The wife was born in Campbell County, Ky. She died ten years ago, of peritonitis, after six days of illness. Her father, who is now living, never heard of hemophilia, and is quite sure that none of his immediate ancestors had it.

In short, the most careful investigation into the family history makes it probable that the disease originated in this family; but the most careful inquiry fails to throw any light on the causal conditions. There is no history or evidence of tuberculosis or syphilis in the family. There was no blood-relationship between the husband and wife. The family has always lived on a farm, and has had plenty of food, fresh air, and exercise. The boys and girls alike have been accustomed to the hardest kind of farm labor, and all except the bleeders are types of health and strength.

There were nine children in the family, four of whom are now dead.

Lizzie Denner, the oldest child, is not a bleeder. She is married, and has three children, all boys, one of whom is a bleeder. (Case III.)

Charley Denner, the second child, bled to death when two years and three months old. (Case I.)

Henry Denner, the third child, died when fifteen months old, of "summer complaint."

Kate Denner, the fourth child, died when one year old, of "summer complaint."

Harry Denner, the fifth child, was not a bleeder. He died, when nineteen years old, of peritonitis, which came on without apparent cause.

Martin Denner, aged sixteen, is strong and well. He was never sick, and is not a bleeder.

George Denner, aged fourteen, is a bleeder. (See Case II.)

Sallie Denner, aged twelve, is well, and is not a bleeder.

Willie Denner, aged ten, is well, and is not a bleeder.

From this family history the diagnosis of hemophilia is plain. The parents were non-bleeders, and they came from non-bleeder ancestors, yet they produced a family of bleeders, and the disease has passed by heredity to their grandchildren. Here we have the strange phenomenon of children inheriting from their parents a disease that neither of these parents nor any of their ancestors ever had. In this field for speculation we may suppose that two or more harmless factors were so united in the marriage of Charles Denner and his wife as to produce in their descendants this strange disease, the pathology of which is quite as obscure as its etiology. During the past few months I have tried, but failed, to make arrangements for studying the blood of the various members of this family. What I especially wished to inquire into was the comparative number of blood plaques to be found in the bleeder and the non-bleeder, believing as I do that such an investigation may throw some light on the pathology of this disease.

Now let me give a brief history of the cases, calling special attention to the method by which the bleeding was stopped in Case II:

CASE I.—On June 1, 1866, Charley, the oldest son, two and a half years of age, came into the house bleeding from the upper surface of the tongue, about half an inch from the tip. The parents thought the child had bitten its tongue, although there was no wound to be seen, or any evidence of injury other than the bleeding. The bleeding continued, notwithstanding competent medical attendance, until five days later, when the child died from exhaustion.

CASE II.—In 1884, George, aged seven years, bled for five days from a very small scalp wound. With two physicians in attendance, the bleeding was only finally controlled by perchloride of iron and compresses.

On May 30, 1891, I found this same boy, now fourteen years of age, awaiting me in my office. He told me that he had been bleeding constantly for the past twenty-six hours. The bleeding-point was in the median line of the upper surface of the tongue, about one inch from the tip. There was no history of injury or evidence of a wound, other than the blood oozing from the bleeding-point.

I learned from the boy's father, who accompanied him, the family history as I have narrated it, and the history of this boy's previous attack of bleeding seven years before. I also learned that during the last few years he had several times suffered from painful swellings of the elbow-joints, with a dark-blue discoloration of the skin near the joint. This history, together with the fact that the boy had been treated with styptics of various kinds before coming to me, at once made the diagnosis clear, and the prognosis very doubtful. The details of treatment during the next few days are of no special interest. Ergot and tincture of iron were given internally and applied locally; perchloride of iron, tannic and gallic acids, and nitrate of silver and other styptics were applied. Collodion and other applications suggested by medical friends were also tried. But in spite of all treatment the boy continued to bleed until June 2d, the fifth day of the hemorrhage. By this time he was quite weak, and had a tired, anxious look; his lips were pale, his pulse 120, and at times intermittent.

The morning of June 2d I searched in vain the largest instrument house in Cincinnati, hoping to find some instrument suitable for compressing the bleeding-point. Returning home, I remembered that I had in my possession a large clamp, made for work in experimental physiology. It was found and used in the following way: A small piece of cotton was saturated with Monsell's solution, and placed on the bleeding point. Over this was laid a larger piece of dry cotton to act as a compress. This compress in position, the tongue was engaged between the two brass plates of the instrument, the upper plate holding the compress in position. The nuts were now screwed down so as to hold the tongue securely in the grasp of the instrument. The tongue, with the instrument applied, could occupy its normal position in the mouth. The compression was continued for two hours, and during this time the grasp of the instrument was several times slightly relaxed to allow better circulation in the tip of the tongue. In two hours the instrument was removed, and the bleeding did not recommence. The boy very quickly recovered from the effect of this hemorrhage, and has had no bleeding since. But early in July both elbow-joints again enlarged, and were very painful, and near the joint were large dark-blue spots, marking the site of interstitial hemorrhages. Since this time the boy has been disabled the greater portion of the time by these painful joint-swellings.

CASE III.—A male child, two years of age, is the youngest of three children, all boys; the other two are not bleeders. The mother of this child is Lizzie Denner, the oldest child of Charles. The father of the child does not come of a bleeder family. The child at present has painful joint-swellings, marked with blue spots, showing interstitial bleeding. This child has twice had very dangerous hemorrhage from slight scalp wounds.

In this case the disease was inherited, and passed through a female non-bleeder to her male child, thus illustrating the important influence of heredity and sex in perpetuating this interesting and mysterious disease.

A CONTRIBUTION TO THE STUDY OF ACCIDENTS FROM EQUESTRIANISM.

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I HAVE records of forty-four consecutive accidents happening to horseback riders during the past few years, and present herewith an analysis of them. I

recall quite a number of minor injuries, mostly slight bruises and sprains, of which I have made no note. A vast number of this nature must have occurred here not demanding serious consideration, those discussed being such only as really demanded treatment. The accidents have been very largely among the cowboys of this region, but five of the whole number occurring in females. The cases are tabulated according to the most serious injury when more than one affected the same individual. Although most of those injured received bruises and contusions, in addition to the affection for which they have been entered here, in no case were these of sufficiently serious nature to demand consideration under other headings. There have been no fatal cases among them, and the recoveries have been what we may term surgically perfect, excepting as noted later.

Thirty-nine of the forty-four were males (88.7 per cent.), of an average age of twenty-three years. Five were females (11.3 per cent.), of an average age of twenty years. The head was injured six times, or 13.6 per cent.; the trunk three times, or 6.8 per cent. The extremities were affected in thirty-five cases, the upper in fifteen, or 34.1 per cent., and the lower in twenty, or 45.4 per cent. Of these thirty-five injuries that we might term unilateral, twenty were upon the left side, or 57.1 per cent., and fifteen upon the right side, or 42.9 per cent. I have had a strong impression that the left side sustained a far greater proportion of these accidents than the right, but this seems doubtful, judging from the limited material at our disposal, if there be any foundation at all for such a belief.

The injuries to the different parts have been generally from totally different causes. Those to the head, six in number, were, excepting one, from being directly thrown so that the head struck the ground. In the exceptional case the boy was dragged nearly a mile on his back by the stirrup. Of injuries to the trunk, one was caused by being struck by the saddle-horn, and the other two apparently by the horse rolling over the rider.

With the upper extremities the injury has been from striking the ground (in one case a building), often, no doubt, in the effort to save the face from injury. In all but two cases, on the contrary, the affection of the lower limbs has been from the weight of the horse's body, as it fell upon the part injured. In these two cases, synovitis of the knee occurred, apparently from the shock of alighting.

Of the whole forty-four cases there were: of fractures alone, seventeen instances; of dislocations alone, three instances; of fractures and dislocations in combination (both of the elbow-joint), two instances. Thus 50 per cent. of all injuries were included under fractures and dislocations.

There was but one compound fracture, this being of the right leg into the knee-joint, caused by the horn of the saddle after the rider lay on the ground. The simple nature of 95.5 per cent. of all these fractures and dislocations is in refreshing contrast to the compound injuries of this class so common in railroad and machinery accidents. I have included one case of separation of the epiphysis among the fractures. To me, the most surprising showing of this portion of the table is the relative infrequency of dislocations. Two of the three were of the shoulder, and one of the left metatarsal bone.

There were no fractures of the shaft of the humerus. In two cases the internal condyle was separated and both bones of the forearm dislocated, in one instance backward, in one inward. In one case the left external condyle alone was broken. The clavicle was broken in three cases, the left one in each. There was one instance of green-stick fracture of the bones of the right forearm, from the rider being thrown against a building by a bucking horse. Two Colles's fractures of the right arm were noted.

One robust young man (aged twenty-six) received an impacted fracture of the neck of the left thigh-bone as his horse fell upon him. His youth should be noted, although, inasmuch as the horse weighed about 1000 pounds, it would not seem that age could influence the result very much. There was but one fracture of the shaft of the femur, occurring in a man about twenty-five years of age, from a fall directly over a rail as the rider crossed the track, a led horse having pulled the ridden one over on to the rider.

But one comminuted fracture was seen, this being the compound one already mentioned. Four distinct pieces of the tibia were made out in this case. Both bones of the leg were broken in two other instances, the tibia only in one, and the fibula only in three.

There were six cases of sprained ankle, three of the right, and three of the left. As the milder cases of this injury rarely come to the notice of the surgeon in a sparsely settled country, I believe, from the number of cases of which I have known or that I have seen without being called upon to treat, that this is as common as all the other injuries together, for the foot is very frequently caught under the horse when turning suddenly, or in falling on slippery ground.

Two of the cases of concussion of the brain, one of them being the boy mentioned as having been dragged nearly a mile by the stirrup, have not been entirely sound of mind since; the other of these two cases showed, in addition, considerable wasting of the muscles of the left side for a year after being hurt. It is probable that something more than a

simple concussion occurred in these cases, although, as in both instances I saw them first several days after the injury, I am unable to say just what it may have been.

The man with the impacted fracture of the hip naturally has a slight limp, as I informed him that he would have. The fracture of the internal condyle, with dislocation of the radius and ulna inward, left motion limited to about two-thirds of the natural amount. This case was not seen by any physician until the sixth day, the family, in some unaccountable way, supposing it to be a simple sprain.

In the fracture of the thigh there was a shortening of one-half inch. I believe most of this would have been avoided had not the patient been a cowboy. The muscles of his thigh, developed by a life in the saddle, contracted very firmly, and I found it impossible to overcome the tendency to shortening.

ORIGINAL ADDRESS.

THE OBJECTS, PLANS, AND NEEDS OF THE LABORATORY OF HYGIENE.

An Address delivered at the Opening of the Laboratory of Hygiene of the University of Pennsylvania, February 22, 1892.

BY JOHN S. BILLINGS, M.D.,
DIRECTOR OF THE INSTITUTE; SURGEON, U. S. ARMY.

FROM those who have preceded me you have heard of the origin of this Laboratory, and something of the wishes, hopes, and expectations of the public with regard to it, as indicated by the donor, and by representatives of the University and the State.

You see clearly that this magnificent gift imposes a heavy responsibility upon those who are charged with the duty of managing it, and of seeing that it is so used as to meet the many and various demands which may rightfully be made upon it; and, in attempting to explain to you briefly what the Laboratory now is, and why it is as it is, I come before you oppressed with a keen sense of this responsibility, which is not lessened, but rather increased, by the fact that I feel that I am speaking to friendly critics.

For this new building, with its equipment and resources, is but an implement—a piece of mechanism—which may be used to shape products of vast importance, not only to the world as it is, but to generations not yet conceived; or which, on the other hand, may be so used as to be of little more importance to humanity than the toy tool-chest or the doll's-house of a child.

What this use shall be depends upon the force and skill applied to it; upon the materials submitted to it; upon the ability of those who guide it to foresee the direction in which at each moment of time it is best to move it; upon the knowledge and patience of those who are working in it; and, when all these are at their best, the results must still depend upon the decrees of Divine Providence, upon circumstances which no man can fully foresee, and which, therefore, no man can, with certainty, control to the end desired.

The position of laboratories in their relations to education, to science, to technology, and to the executive departments of governments and the welfare of the public, has become a very notable one within the last fifty years. A laboratory—or, as it was called in old times, an "elaboratory"—is, as its name indicates, a place for labor, for work—and especially for skilled labor, in the making of delicate and difficult observations and experiments; for analysis, to determine composition and causes; for synthesis, to determine the results of new combinations; for solving old problems, and for stating new ones. It is not a museum, or a store-room, or a show place; nor does this kind of a laboratory offer much for sale, except opportunity.

Only an opportunity—just a few possibilities, offered to the man who desires knowledge, who wants to see, and touch, and try for himself. Yet this offer of such an opportunity is what distinguishes it from those institutions established for the benefit of individuals.

The ideal laboratory of the alchemist or philosopher of bygone days was a mysterious, dusky place, the operations in which were kept a profound secret, and which thus gained in repute what they could not have obtained by publicity and free criticism.

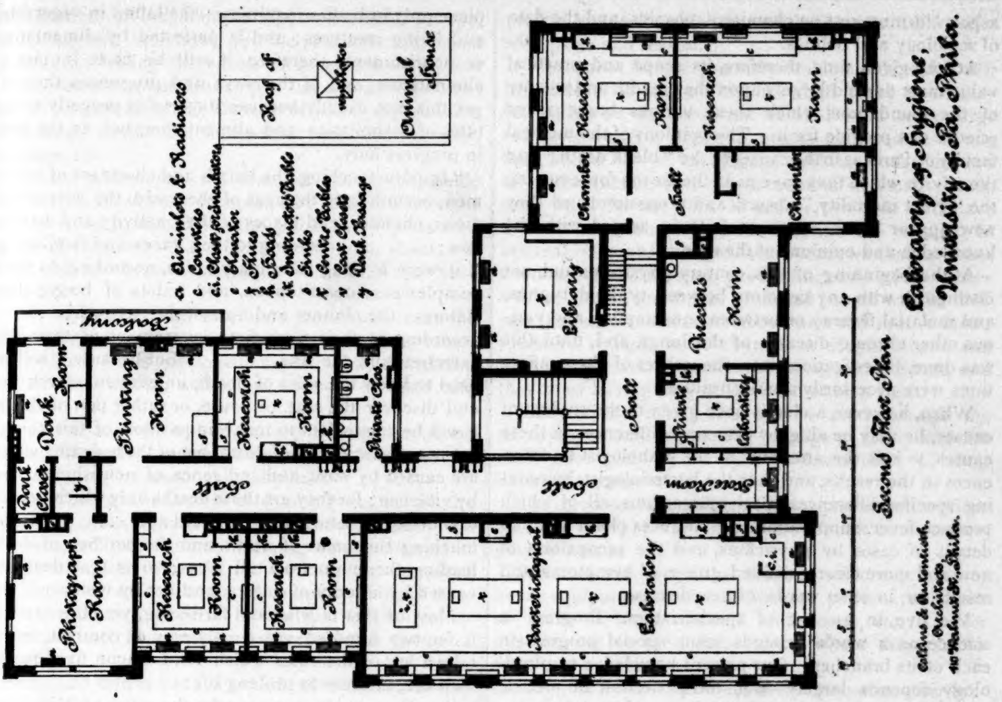
Laboratories planned and fitted for public use, offering to anyone who is able and willing to pay a moderate fee and to submit to a few simple regulations, not only opportunities for learning the details of the processes carried on therein, but also facilities and means for making special research that he could only obtain otherwise at great expense and loss of time; such laboratories, I say, are all of comparatively recent date.

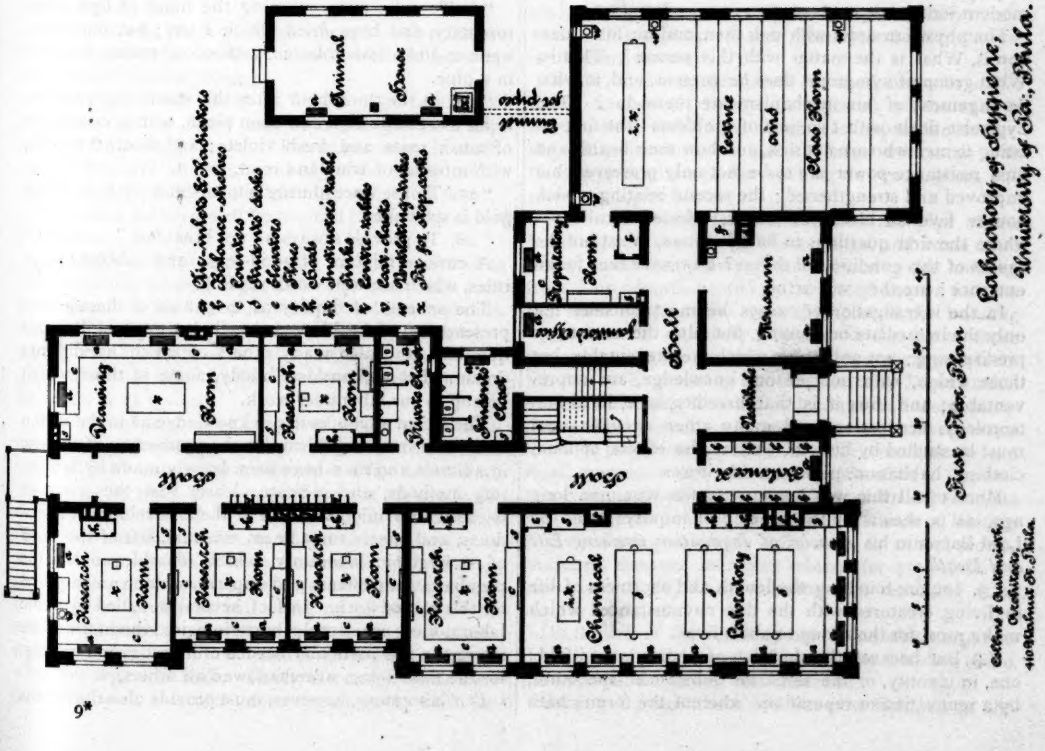
It is not yet twenty years since the first separate institution of this kind was established for hygiene—and even now there are not more than a dozen such laboratories, specially built and fitted for their purpose, in existence throughout the world. Of these, the best known is probably that of the University of Munich, under the direction of Professor Pettenkofer, while the largest is that of Berlin.

This laboratory is the first structure of its kind erected in the United States, and it therefore opens a comparatively new field of work in this country. What is the nature of this field, and what are its boundaries?

The object of hygiene is to preserve and to improve health, and there are few matters affecting the physical, intellectual, emotional, and moral condition of man as an individual, or of men in communities that may not come within the scope of its investigations. The destruction or avoidance of causes of disease is but a part of its objects—it is at least equally concerned with the means of making a man better fitted to resist these causes. "That kind of health," says Montesquieu, "which can be preserved only by a careful and constant regulation of diet is but a tedious disease." Disease, like health, is a vague term, including widely different and often very complex conditions, processes, and results, which must be observed, classified, and described in such a way that different men, widely separated in space and time, may know that they are seeing the same things, and thus may have the benefit of each other's experience.

In its scientific aspects, then—those which relate to definite and precise knowledge—hygiene rests largely on physiology and pathology, the third leg of the tripod being formed by vital statistics; while, in its practical


Second Floor Plan
Laboratory of Hygiene,
University of Pa., Philo.
Photograph Room
Dark Closet
Dark Room
Printing Room
Research Room
Bacteriological Laboratory
Store Room
Library
Hall
Animal House


First Floor Plan
Laboratory of Hygiene,
University of Pa., Philo.
Drawing
Research Room
Chemical Laboratory
Lecture and Class Room
Museum
Hall
Animal House

aspects, it must rest on chemistry, physics, and the data of sociology and politics.

At any given time, therefore, its scope and practical value must depend largely upon the breadth and solidity of the foundations which these various branches of science can provide for it. The opinions of the medical faculty of Paris as to the causes of the "black death," and the advice which they gave as to the means for lessening the "great mortality," absurd and preposterous as they now appear to us, were yet fully in accord with the knowledge and opinions of the time.

At the beginning of this century physicians did not distinguish with any certainty between typhoid, typhus, and malarial fevers; or between consumption and various other chronic diseases of the lungs, and, until this was done, investigations into the causes of these affections were necessarily almost fruitless.

When, however, a clue is once given to the student of causes, he may be able, by detecting differences in these causes, to call the attention of the pathologist to differences in the results, and thus the bacteriologist, by proving specific differences in microörganisms, all of which produce fever, suppuration, etc., induces closer study of details of cases by physicians, and the recognition of new and more clearly defined groups of symptoms and results, or, in other words, of new diseases.

We live in an age of specialization. Progress in science as a whole depends upon special progress in each of its branches. Our present knowledge of physiology depends largely upon the perfection of electric methods. Pathology and pathologic bacteriology are now waiting for increase of knowledge in organic chemistry. The law of evolution applies to this as it does to modern industrial progress.

The physician deals with sick men, and his first question is, What is the matter with this person? That is, What group of symptoms does he present, and to what derangement of his mechanism are these due? The hygienist deals with two sets of problems—the first relating to men who are not sick, and how their health and vital resistance-power are to be not only preserved but improved and strengthened; the second relating to sick houses, feverish blocks or wards, infected localities—where the first questions to be solved are, What are the causes of this condition of things? how have they found entrance? are they still acting?

In the investigation of causes he must consider not only the immediate or exciting, but also the remote or predisposing; not only those which are preventable, but those which, with our present knowledge, are unpreventable; and thus it is that heredity, race, local meteorology, occupation, and many other circumstances must be studied by him, as well as the effects of food, clothing, habitation, poisons, and viruses.

Much of all this was known to a few wise men long ago, as is shown by the scheme of inquiry stated by Lord Bacon in his *Articles of Inquisition touching Life and Death*:

"3. Inquire touching the length and shortness of life in living creatures, with the due circumstances which make most for their long or short lives.

"4. But because the duration of bodies is two-fold; one, in identity, or the self-same substance; the other, by a renovation or reparation; whereof the former hath place only in bodies inanimate; the latter, in vegetables and living creatures; and is perfected by alimentation or nourishment; therefore, it will be fit to inquire of alimentation, and of the ways and progresses thereof; yet this, not exactly because it pertains properly to the titles of assimilation and alimentation, but, as the rest, in progress only.

"Inquire touching the length and shortness of life in men, according to the ages of the world, the several regions, climates, and places of their nativity and habitation; . . . according to their races and families, as if it were a thing hereditary; also, according to their complexions, constitutions, and habits of body; their statures; the manner and time of their growth; . . . according to their fare, diet, government of their life, exercises, and the like. . . . But because it will be hard to know the ways of death, unless you search out and discover the seat, or house, or rather den of death, it will be convenient to make inquisition of this thing; yet not of every kind of death, but of those deaths which are caused by want and indigence of nourishment, not by violence; for they are those deaths only which pertain to a decay of nature, and mere old age. . . . Inquire touching the point of death, and the porches of death leading thereunto from all parts; so as that death be caused by a decay of nature, and not by violence."

Most of this is wise and far-seeing, yet little came of it for two hundred years. By way of contrast, let us take a few of the rules which Lord Bacon fixed for his own use, in order to prolong life:

"1. Once in the week to take the water of Mithridate distilled, and some grains of niter and saffron, in the morning between sleeps.

"6. To take every morning the fume of lign-aloes, rosemary, and bays dried, which I use; but once in a week to add a little tobacco, without otherwise taking it in a pipe.

"10. In the third hour after the sun is risen, to take in air from some high and open place, with a ventilation of musk roses and fresh violets; and to stir the earth, with infusion of wine and mint.

"17. To use once during supper-time wine in which gold is quenched.

"28. To provide always an apt breakfast."

A curious mixture of good-sense and rubbish, these rules, which are well worth reading.

The scheme of inquiry as to causes of disease and preservation of health to-day includes most of Bacon's questions, and also many others of which he did not dream. Let us consider, briefly, some of those which belong to our laboratory work.

The recent advances in our knowledge as to the action of certain microörganisms in the production of disease in animals and man have been largely made by laboratory methods, and indicate clearly that the study of bacteria and microzoa, and of their development, products, and effects, must be an essential part of the work of a hygienic laboratory, which should provide the peculiar arrangements and apparatus which are required for this sort of work. In fact, several so-called hygienic laboratories are simply bacteriologic laboratories, the interest in this particular branch of investigation having, for the time being, overshadowed all others.

Our laboratory, however, must provide also the means

for chemical investigations of air, water, food, sewage, secretions and excretions, and the products of bacterial growth; for testing the effects of gases, alkaloids, and albumoses of various kinds upon the animal organism; for investigations in the domain of physics, pertaining to heating, ventilation, house-drainage, clothing, soils, drainage, etc.

Perhaps a summary of what the German hygienic laboratories have been occupied with for the last five or six years, as indicated by the published reports and papers of those who have been working in them, will afford some indications as to the field which they have occupied.

First in number and extent, as just stated, come the bacteriologic investigations relating to anthrax, tubercle, typhoid fever, erysipelas, suppuration, diphtheria, pneumonia, cholera, and other diseases of men and animals.

Closely connected with these are the experiments on disinfection, and the testing of various forms of apparatus for disinfecting by steam or by dry heat.

Next come examinations of drinking-waters, of the effects of various impurities in waters, effects of lead pipe on waters, self-purification of running waters, changes in stored waters, etc. The effects of working in compressed air; the air of school-rooms, of assembly halls, of hospitals; the dusts and germs of the air, its changes by respiration and by ventilation, form another group of subjects.

Foods and drinks have occupied much attention—the quantity and quality of different articles that are most desirable—their adulterations, preparation, and preservation, including studies of meats, bread, milk, beer, wines, meat-extracts, etc.

Soils of streets, gardens, cemeteries, etc., with reference to their moisture, gases, and bacteria, seem to have received much investigation.

Clothing, various kinds of lighting, of heating, of plastering, and of floors and floor fillings, have kept some of the students busy. "Poisonous colors in clothing," "Bacteria in rags, canned foods, damp walls, shoes, ice," "Modes of disinfecting walls and floors," "How can a polluted well be purified?" are titles taken at random.

Just at present, research is being specially directed to certain minute animal organisms—the microzoa—such as are found in the blood in malaria and in the skin in certain diseases, and to immunity, especially to that immunity which may be artificially produced.

Experimental investigation is a slow process, and very uncertain in its results.

An experiment may be conceived which seems as if it would give important results. The experiment itself would require only a few moments or a few hours if all the apparatus were ready to produce the required conditions, and to record in terms of weight and measure the results obtained. But to make this apparatus in the best form, and to provide the means of recording, may take a year or more, and in making this preparation a dozen problems will come up to be solved by other experiments. You are pretty sure to discover something new, but by no means sure that it will be what you began to seek. Every discovery opens new questions and indicates new experiments, and the precise shape in which the work presents itself varies with place and season.

We cannot foresee precisely the demands which will be made upon us, or which we shall make upon ourselves, but we do know that we shall want some large rooms in which a dozen or twenty men can be at one time taught how to investigate, working under the eye of an instructor; and also a number of small rooms, each fitted for the work of one or two men who have attained a certain degree of skill, and are engaged in original research. In all of these rooms we shall at times need to use microscopes, gas-heating, and steam; there will be vapors and fumes produced; there will be delicate instruments scattered about, and the rooms must, therefore, be light, have abundance of gas, steam, and water, hoods and flues for conveying away fumes, and they must have plenty of fresh air without dust.

Many of the things that will be seen through the microscopes will be rapidly changing form, and we shall need pictures as well as descriptions of their different shapes.

The most useful drawings for our purposes are those made by sunlight, and, therefore, we want photo-micrographic rooms.

We shall wish to test the merits of various articles of house-equipment, such as different patterns of steam radiators, of traps, of sinks and closets, etc., and for this purpose we must have places where they can be fitted and put into use.

We must know what other investigators in other laboratories, and many places besides laboratories, have done and discovered, that time and effort may not be wasted. We must, therefore, have the books and journals in which these are recorded, which are already many, and coming rapidly. A small library and reading-room is therefore essential.

Much of the apparatus to be used must be either made or specially fitted and adjusted on the spot to meet special indications which it is impossible to foresee, and, therefore, we need a large workshop, with tools and appliances for working in wood, glass, and metal, and with power.

Let us now look for a moment at the plan of the building, and see how all these things, and some other needs, have been provided for. Entering the building from Thirty-fourth Street, on the west front, we find, on the main floor on our right, that part of the building which is more especially intended for the use of those not working in the research-rooms, but coming in from the Arts or Engineering and Architectural Departments of the University for special lectures and demonstrations. This contains a lecture-room and class-room, a room for preparing apparatus, etc., for demonstrations, a small museum-room, and the janitor's office. The lecture-room is fitted with various devices for experiments and demonstrations upon different methods of heating and ventilating assembly halls, such as school-rooms, churches, theaters, including means for propulsion or aspiration of air, for introducing and removing it at various levels, etc.

On the left of the vestibule are doors which separate the laboratory and research part of the building from the semi-public portion just described.

Passing through these, we have in front of us the

large chemical laboratory in which the students are to be made practically familiar with methods of examining air, water, foods, soils, etc. Next to it is the balance-room. Then come, on the north front, four special research-rooms, and on the south one research-room and a large drafting-room for the preparation of drawings and plans relating to heating and ventilation, house-drainage, sewerage, and water-supplies.

The radiators in the large chemical laboratory on the north front are each of a different pattern, and so arranged as to permit of the testing of the relative efficiency of each, or to permit of the substitution of other forms for such testing.

Ascending to the second floor, the outlines of which are the same as those of the first, we find, over the chemical laboratory, a large bacteriologic laboratory well lighted from the north, with working places for twenty students.

On this floor are five research-rooms, the photograph and photo-micrographic rooms with dark-rooms, the director's room and private laboratory, a library and a supplies-room.

The basement contains a large, well-lighted workshop, a combustion-room, a cremating furnace, a boiler-room, and an engine-room, and rooms for the janitor.

I will not go into details as to the purposes and uses of the various flues, hoods, pipes, and valves which you will see in every room. It is sufficient to say that they are designed not only for the convenience and use of the workers, but for experiments and demonstrations of many kinds.

The drainage of the building is on a double system, and is so arranged as to permit of the trial of new forms of traps, sinks, closets, etc. All pipes are freely exposed to view, and the different systems for cold water, steam, drainage, etc., are each painted a different color.

When you visit the Laboratory—as I hope you will do not only immediately after these exercises, but many times in the near future—you will see more clearly its arrangement than you can from a mere inspection of the plans.

As regards the external appearance of the building, opinions will, of course, differ. I will only say that it has been planned from within outward, which is the reason why it looks like a laboratory and not like a castle or a cathedral; and there is very little useless exterior decoration. Sky-lines and projections or recesses to obtain shadows have not received much consideration; space, light, and adaptation to the work to be done have been the points insisted on.

In many respects it affords a striking contrast to the library building in which we are assembled, and it is fit and proper that it should do so. The library represents the garnered experience and wisdom of the past; the laboratory is the workshop of the future. One is fruit, the other is seed.

In this connection I wish to express my high appreciation of the important work of the architects, Messrs. Collins & Autenrieth, of this city, in preparing the plans and specifications for this building and in supervising its construction, and especially to thank Mr. Collins for the many valuable, practical suggestions which he has made as the result of his careful study of our purposes and needs.

So much for the building and its contents as it is, and why it is as it is. The chief object of its existence is to fit a certain number of men from all parts of the country to investigate and solve the problems connected with the securing of the best health and vigor among our people.

We hope, also, that some increase of knowledge will be made here by the workers in the Laboratory itself; but the main point to be kept in view is to provide well-trained, scientific, and practical men for other fields of labor. Dr. Mitchell has said that the true rate of advance in medicine is not to be tested by the work of single men, but by what the country doctor is. So, also—and even more so—advance in practical sanitation is not to be measured by laboratory records, but by what health officers and sanitary engineers are able to accomplish.

Even now we *know* much more than we *do*, and the skilled sanitarian too often finds himself in the position of the unhappy daughter of Priam and Hecuba, who could foretell, but to no purpose.

This Laboratory is fortunate in being closely connected with, and in the immediate vicinity of, a great medical school, and of great hospitals. As was said before, one of the essential foundations of scientific knowledge of the causes of disease is minute and accurate diagnosis and pathology, and we are, therefore, in constant need of the best knowledge of leaders in these branches of medical science. The hospital is filled with specimens of the results of such causes, acting on the human body—from one point of view, Nature's experiments with poisons cunningly elaborated in the tissues of the body, or with viruses coming from without, upon blood and bone, muscle and brain. Much of the work of this new department will be connected with the results of these experiments.

The Laboratory is also fortunate in being located in a great manufacturing city, where the effects of different occupations, of trades dangerous or offensive by reason of dusts, or of vapors, or of waste-products, can be readily observed and the materials for study obtained. There is an immense field for a sanitary clinic here, and in the habitations, the streets, the water-supply, and the sewers of Philadelphia.

These clinics, however, cannot, as a rule, be reported for the press, either lay or medical, since to do so would, to a great extent, defeat their object; the great majority of sick houses and manufactories must be considered as strictly private patients, and their affairs held as confidential. In the case of public institutions, or of public nuisances, a somewhat different rule may apply.

Practical hygiene is to play an important part in municipal government, to secure the best form of which is now one of the most urgent questions of the day. Many of the questions to be decided by city officials as to water-supplies, sewage-disposal, etc., require expert knowledge to answer.

Of course, the subject of hygiene and the work of a University department devoted to the increase and diffusion of knowledge in sanitary science extend far beyond the experiments and demonstrations for which this Laboratory is specifically fitted.

Bacteriology, chemistry, pathology, physics, and medical and vital statistics give us the foundations, but

sociology and jurisprudence must also be studied in their relations to sanitation to obtain the best results.

It is in and to the home and the workshop that these results are to be applied, and he who aspires to be his brother's keeper must know how his brother lives.

Labor questions, education questions, maritime and inter-State commerce questions, and methods of municipal finance and government are all intimately connected with matters of personal and public hygiene; and economic consequences, as well as health, must be considered in the advice and regulations of the sanitarian.

I count it as fortunate, therefore, that there is a law school and a school of finance and political economy in this University to which the Department of Hygiene can look for advice and friendly criticism when these are needed, as they surely will be.

And now a very few words as to the needs of the Laboratory. First of all it needs men—men thirsting for knowledge, and fitted by previous training and education to come here and acquire that knowledge, not merely the knowledge that exists in books or that the teachers in this Laboratory may possess, but that which is yet unknown, the weight of that which no one has yet put in the balance—the shape, and size, and powers for good or evil of things the existence of which has not yet been demonstrated—men who will patiently and earnestly seek the answers to the questions, "what?" "when?" and "how?" in the hope that thus they may by-and-by obtain some light upon the more difficult problems of "whence?" and "whither?" even if they may never be able to answer "why?"

There are not many such young men whose tastes will be in the direction of these lines of research, and of these there will be very few who will have the means to support themselves while engaged in the work. We need, therefore, the means to help them in the shape of half a dozen fellowships, paying about five hundred dollars a year each, and granted only to those who give satisfactory evidence of capacity and zeal.

The second thing we want is a demand on the part of the public for really skilled, well-trained sanitary investigators and officials, such as we hope to send out from here; we want a market for our product; we want the legislators of this and other States, and of our rapidly growing municipalities, to be educated to appreciate the importance and practical value of such health officials, and to give the best of them employment.

Thirdly, the Laboratory wants the coöperation and assistance of sanitary authorities and inspectors, and especially of those of this city and State.

It needs to know from time to time what they are interested in and are working at, to have the opportunity of showing to its students cases of special interest—sick houses, localized epidemics, special forms of nuisance.

And, on the same principle and for the same reasons, it desires to have its attention called to special methods of heating, ventilating, and draining buildings, and especially public buildings, such as schools, hospitals, prisons, churches, and theaters, and to matters connected with the hygiene of manufacturing establishments and special occupations, methods of disposal of offensive or dangerous waste-products, of protecting workmen against dusts, gases, etc.

In short, we want to know how these things are managed by the men who have a practical interest in them; and if, in our turn, we can suggest improvements, we shall be glad to do so.

Fourth, the Laboratory wants a reference library as complete as it can be made, and always up to date. Many of the books and journals required must be purchased, and for this purpose a special fund is needed, but many of the works required can only be obtained by gift.

Thus, we want all the reports of boards of health—State and municipal—of municipal engineers, waterworks and water commissioners, park commissioners, etc.

We want the catalogues and circulars of all manufacturers of heating and ventilating apparatus, of plumbers' supplies and house fixtures, of electric and gas fixtures, of machinery and apparatus connected with water-supply and sewage-disposal.

We want copies of plans and specifications of large buildings of all kinds.

And these things can only be obtained through the aid and good-will of manufacturers, engineers, architects, and sanitarians all over the country; and this aid I venture to ask, feeling sure it will be granted by those who know what is wanted.

I will mention but one more special want to-day, and that is of means for the proper publication of illustrated reports and accounts of the work done in the Laboratory.

In the meantime we must be patient, and not too eager to touch the fruit of the blossom that is not yet blown.

In the chambers of this Laboratory are to be explored and tested some of the strangest and subtlest of the manifestations of force which surround and are within us.

Here we are to deal with problems of life and death; to seek to unravel some of the webs which bind and choke our children, and which make our strong men helpless, that we may for a time, at least, put these trammels aside, or sever them.

I dare not attempt to promise or to prophesy as to the work which will be done here, or as to the future of this new department of the University.

Those who are to be connected with it may not do the best that can be done, but at least they must do the best they can, and, if needful, give place to others who can do better.

Those to whom we owe this Laboratory and its equipment and endowment, have been generous and wise in their generosity, which has been in accord with the teaching of the son of Sirach, "Having grace in the sight of every man living, and detained not for the dead."

Death comes by many paths to one or other of the three porches of the microcosm through which he enters, and brings his poppy flowers to all doors soon or late; but if we knew that which we might know, and did that which we might do, he would be preceded by fewer heralds of suffering, and would arrive only when we were ready to be "hushed in the infinite dusk."

If "ye shall know the truth, the truth shall set you free"—not free from change, or from grief, or from the final passage beyond the veil, but free from causeless

fears, from unnecessary pain, from useless labor; and this is a part of that wisdom "which passeth and goeth through all things," and is "the brightness of the everlasting light, the unspotted mirror of the power of God."

ORIGINAL LECTURE.

LINEAR CRANIOTOMY.

A Clinical Lecture delivered at the Arapahoe County Hospital, October 9 and 16, 1891.

BY CLAYTON PARKHILL, M.D.,
OF DENVER, COLORADO;
PROFESSOR OF ANATOMY AND CLINICAL SURGERY IN GROSS MEDICAL COLLEGE; VISITING SURGEON TO ST. LUKE'S, DRACONESS, AND ARAPAHOE COUNTY HOSPITALS, ETC.

THE boy to be operated upon to-day presents the following history, taken from the case-book of Dr. Eskridge, under whose care he has been for the last four weeks: L. A., four years of age last February, began having spasms when two days old, which lasted four days. After this he had whooping-cough for four months. One year ago he commenced failing. After the spasmodic seizures, he would be unable to get up for a week. These attacks occurred one or two weeks apart. Six months ago they became very severe and increased in frequency, often occurring two or three times a day. He would fall on the right side of the face, and the mother thinks that the right leg was affected. The examination of the eyes was made by Dr. Chase.

You see that the boy is fairly well grown and well nourished. The only abnormal condition that we observe is that the head is not developed in proportion to the size of the body. In other words, this child presents a condition known as microcephaly, or he is a microcephalic child. There are two theories regarding the beginning of this condition—one is that there is premature ossification of the cranial bones, thus preventing the proper development of the brain; the other is, that there is an imperfect development of the central nervous system, and that the cranial bones share in this condition, whatever may be the cause giving rise to it. The fact remains that the cranium is too small.

Lannelongue did the first operation for the relief of microcephalus. The procedure consisted in removing a narrow strip of bone from one side of the skull, making of the cranial bones two lateral flaps, which might be extended by the growing brain. He called this operation craniectomy. Keen has followed him, and has proposed the name of linear craniotomy, which I consider the better term for it. When the term "ectomy" is used in connection with an operation, it signifies a complete removal of the organ spoken of. In this operation we do not attempt to remove the cranium, but only make an incision into it and remove a small portion; so that I believe the term linear craniotomy, which signifies only a lateral incision into the cranium, much the better term.

The original operation has been modified in two instances by Wyeth and McClintock. They removed a strip of bone on either side of the median line, prolonged the incision laterally at each end of this longitudinal incision; and, in addition, made lateral incisions in the middle line toward the ears. They then separated the bones forcibly, thus widening the gap. In view of the mortality which has attended the operation thus far, I scarcely think that we are justified in making such an extensive operation. Horsley believes, that owing to the imperfect development of the nervous system, children are much more liable to shock than they would normally be, and so, with reason, advocates a single operation, as proposed by Lannelongue, and that is the method of procedure which we will adopt in the case before us. I might say, further, that during the time that this child has been in the hospital, every attempt has been made to develop his intellect by teaching, and it has been found impossible to add even the simplest word, the name of the commonest object shown to him, to his vocabulary. Had we found it possible to teach the child anything, it might have been wiser to attempt that method rather than to proceed to such radical measures as we shall institute.

This child has been carefully prepared for the operation. His scalp was shaved yesterday, thoroughly scrubbed with soap and water; afterward with ether, and finally with a solution of 1 : 2000 mercuric bichloride. The head was then bound up in a towel saturated with the mercuric solution, which you see is still in place. We will now remove that and measure the scalp. Ether has been used as the anesthetic and the child is now perfectly under its influence. From the inion to the glabella is ten and three-fourths inches. The biparietal diameter measures six inches. The circumference of the skull is eighteen and three-fourths inches. We will repeat the process of cleansing practised yesterday. Around the side of the head we will wrap a towel wet with a hot bichloride solution and under the child's head we will place a rubber bag filled with hot water. Mr. Horsley believes that it is possible in this way to lessen the shock. Fifteen minutes ago he was given five drops of tincture of nux vomica and a dram of whiskey to give still further support to the nervous system. And now we are ready to operate. I make an incision about three-fourths of an inch to the right of the median line, beginning at the anterior margin of the hair-area, and extending backward to within about one inch of the inion. We have comparatively little bleeding from the skull, as you will observe, because I have taken the precaution to have the temporal artery compressed. We catch the spurting arteries with forceps, and but little blood, as you see, has been lost. The periosteum is now exposed and I will make a single incision through it. I draw aside the periosteum in the same manner as I did the scalp, and we now observe the cranial bones. I apply a three-fourths inch trephine midway between the parietal eminence and the sagittal suture in the median line of the head. I remove the button of bone and you see I have not wounded the underlying dura mater. This bone is peculiar in that it is thinner than normal, not measuring more than one-eighth of an inch in thickness; and, again, it presents no diploic structure. With the Keen forceps I enlarge this trephine opening forward, making it taper to one-quarter of an inch at its anterior extremity, which corresponds with the scalp-incision. I prolong the opening backward in a similar manner, to within about an inch and a half of the inion. You will observe that the inci-

sion is elliptical in shape, measuring three-fourths of an inch wide at its widest point and tapering to either end, and having a length of about six and one half inches. The dura mater is bulging at the bottom of the wound and is rather dark-colored; otherwise apparently normal. With a pair of scissors I now remove a portion of the periosteum corresponding to the bony wound. I will irrigate the wound with a solution of mercuric chloride 1 : 3000, to wash away the fragments of bone left there. Drying it slightly with gauze, I sprinkle it with iodoform and am ready to close the wound, which we will do by means of interrupted silk sutures. I place these sutures one-half an inch apart anteriorly, and three-fourths posteriorly. You will observe that I have made no provision for drainage, but should necessity require it, the wound will drain between the sutures posteriorly, which have been placed so far apart. We will now again sprinkle the scalp with iodoform and apply an antiseptic dressing. The child has borne the anesthetic well and seems to be in good condition, and will now be sent to bed. From the time of the beginning of the anesthetic we have occupied about thirty minutes.

It is my privilege to present to you to-day the child upon which we operated one week ago, and we will dress the case now for the first time. You will observe that the child seems brighter and its appearance is better than before the operation, and he seems to more fully comprehend what is said to him. It is the opinion of the nurses and of the child's mother that his mental condition shows improvement. He has been decidedly less restless and nervous than he was before the operation, sitting sometimes for hours in his bed amusing himself with books in looking at the pictures. His physical condition has been exceedingly good. At 7 P.M. of the evening on which we operated, his temperature reached 100⅘°. From that time it began to decline, reaching normal the following morning. At no time since has it been above normal. He has slept well and has had a good appetite. I will now proceed to remove the dressing. I uncover the wound and you will observe that we have union by first intention. There is no swelling and not a sign of suppuration. I did not intend to remove the sutures for a day or two yet, but the condition is so good that I will take them all out. We will now wet the scalp with a mercuric solution, dress it with iodoform, and again apply our antiseptic dressing. Instead of the bandage to retain this in place I have had a cap made which answers the purpose much better. I will send the child back to its bed, and will tell you something of the other cases following operation.

Four cases have been operated on by Professor Keen. One died one and one-quarter hours after the close of the operation, from what was supposed to have been heart-failure. Another died four hours after the operation. The other two cases recovered and have shown mental improvement. The case of Gerster and Sachs died three and one-half hours after the operation, of acute anemia. Wyeth's case has greatly improved in intelligence. McClintock's case was reported too soon for the operator to decide whether there was improvement or not. Morrison's case showed decided improvement. And these comprise the operations that up to this time have been reported in this country. Horsley operated on two cases in England. One case died a few days following, from a condition of hyperpyrexia. The other case recovered, and showed very decided mental improvement. Lannelongue has reported twenty-five cases with but one death, and in those surviving the operation there has been improvement.

At the recent Congress of American Surgeons, at Washington, Professor Agnew, basing his opinion upon the operations that had been done in Philadelphia alone, decided that the procedure would "confer no credit on surgery." Taking into consideration the result of all the operations that have been done, I cannot agree with even that distinguished surgeon. Of these forty-one cases, five have died and thirty-six have shown mental improvement to a greater or less degree. I doubt whether any method of training that has yet been devised can take forty-one cases and show mental improvement in thirty-six of them. "But," you say, "five have died." Under methods of teaching, I believe you will find a larger number than that will fail to respond; and who can say that, for these little creatures, having no possibilities of intellectual development, death is not preferable to life?

The operation is yet new, and none of these cases have been under observation a sufficient length of time to know how much improvement we may get. The case that I have shown you is the first that has been operated on in the West, and we can only hope that it will continue to improve as much as it promises to do.

CLINICAL MEMORANDA.

A CASE OF AKROMEGALY.

BY H. A. HARE, M.D.,
PROFESSOR OF THERAPEUTICS IN JEFFERSON MEDICAL COLLEGE.

SINCE 1886, when Marie first described the curious disease known as akromegaly, a number of cases have been reported, and in some instances it has been possible to accompany the reports with the results of autopsies, which have quite constantly shown lesions of the pituitary body. In view of the numerous papers that have been published upon the subject in the last few months, I shall simply report this case without comment, in order to put it on record. The patient continues under my care, the disease progressing very slowly indeed.

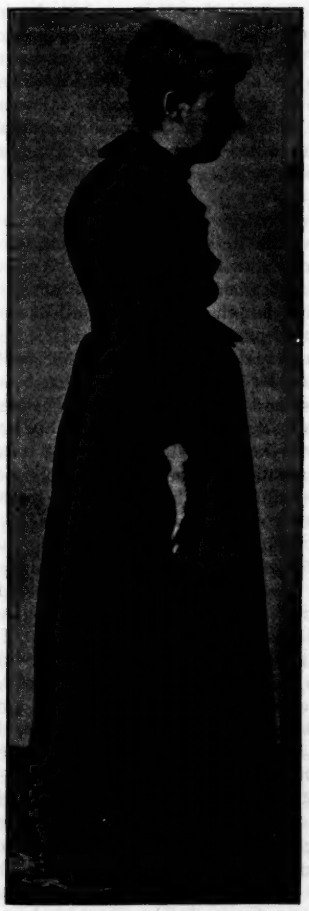
A. M., a woman, aged twenty-five years, a Canadian by birth, has a good family history, and cannot remember that any of her relatives died of malignant disease. Three years ago, her menstruation became exceedingly irregular, stopping at times, and remaining absent for from four to six months. At this time she also noticed that vision began to fail, but more recently the failure has been rapid, and when she came under my care, December 12, 1891, she had become completely blind in the left eye. She states that the loss of sight began in the outer half of the left eye and gradually proceeded across the eye until the vision was entirely lost. Her right eye has also failed markedly in visual power since she has entered the hospital.

Physical examination shows a slight distention of the abdomen, with a general increase in the size of all of the members. There is a peculiar hump in the back from the last dorsal to the seventh cervical vertebra, and this

deformity seems to be characteristic of all well-defined cases. On the anterior surface of the chest, at the third interspace on the right side, there is a bulging half-way between the sternum and the nipple line, as large as an ordinary orange; it seems to be due to an increase in the length of the third and fourth ribs that project further than their fellows. There is no exostosis. Similarly, on the left side, the floating ribs are equally protruding, making a swelling as large as would be that produced by a fetal head if placed beneath the tissues. The hands are increased in size, and there is not only an increase of the connective tissues of the entire body, but also of the bony tissues. The nose is very much enlarged, and the face is massive in appearance. The limbs are also very much thickened, and her appearance is that of a large woman unequally developed. During the last three years, or since the beginning of her illness, she has gained about sixty-five pounds in weight, and I have been fortunate enough to obtain from her a photograph taken before she was ill; and another taken within the last two weeks. Engravings made from them are appended herewith. A comparison of these pictures indicates very thoroughly the great increase in dimensions that the patient has undergone. She has very distinct enlargement of the thyroid gland, but there are no associated circulatory disturbances. For the last few weeks she has suffered severely from neuralgia of the right temporal and supra-orbital region, which becomes very much worse at night, and at times sufficiently severe to prevent sleep. There have also been sharp pains in the extremities, and slight, varying pre-tibial edema. The appetite is good; the urine is rather scanty in amount. Examination of her right ear shows that she has lost hearing on this side, and that there is a chronic purulent otitis media. At the time of admission into the hospital the patient complained chiefly of pain in the left knee, loss of vision in the left eye, and of the absence of menstruation—indeed, she believes that the entire cause of her trouble is due to this latter disorder. She has suffered very much indeed from flashes of heat, which lasted ten or fifteen minutes, and then rapidly disappeared. At the angle of the left scapula, and extending to the vertebra, there is a spot where there is a peculiar itching, which changes to a prickling or tingling sensa-

FIG. 1.

FIG. 2.



tion upon pressure. About October 1st the patient had a hemorrhage from the lungs, and one week later suffered from an attack of epistaxis. The bowels are fairly regular.

Dr. D. D. Stewart, the chief of the nervous clinic of the Jefferson College Hospital, has been kind enough to send me the following account of the electric condition of the muscles and nerves in this patient:

FACIAL NERVE.

Faradic (Flemming's battery).

Switch on button 1, coil fully in: Response in upper facial muscles only, R. and L. side.

Coil out 2 in.: General response both sides.

Galvanic.

Right—Ca Cl c 2 M.a. . . . upper facial muscles.
" " " c 4 " . . . general.
Left— " " c 2½ " . . . upper facial muscle.
" " " c 5 " . . . general.
Right An Cl c 3 " . . . orbicularis palpebrarum.
" " " c 5 " . . . general.
Left— " " c 3 " . . . orbicularis palpebrarum.
" " " c 6 " . . . general.

UPPER EXTREMITY.

Faradic.

Shoulder and upper arm muscles: Switch on button 2, coil all in; electrode on motor points R. and L. side, very good response.

Extensors of forearms: Good response on both sides with switch on button 1, tube out 1½ in.

Flexors, forearm, respond with less strength of current. Current also diffused to them from extensor surface of forearm, causing response in flexors of fingers, with current too weak to cause contraction in extensors.

Galvanic.

Response produced with less current in flexors than in extensors of forearms.

In flexors, Ca Cl c 3 M.a.
" " " c 4 "
" An Cl c 8 "

ANTERIOR CRURAL NERVE.

Faradic.

Switch on button 1, coil out 2⅛ in.: Slight contraction in muscles supplied, on R.; on L. some contraction with coil out 1½ in.

Galvanic.

Right—Ca Cl c 10 M.a.; An Cl c 12 M.a.
Left— " " c 10 " ; " " c 12 "

SCIATIC NERVE.

Faradic.

Switch as before, coil out 2 in.: Contraction better on R.

Galvanic.

Right—Ca Cl c 10 M.a.; An Cl c 12 M.a.
Left— " " c 10 " ; " " c 12 "

The results of the electric examination indicate a normal qualitative response in all parts tested, but somewhat altered quantitative reaction—chiefly in the direction of delay, especially in the thighs.

The slow clonic response to the continuous passage of the faradic current noted some days before in the quadriceps extensor femoris on the R. was also seen in the middle finger of the R. hand in stimulating the extensor communis digitorum.

A study of the blood has been made by Dr. D. B. Kyle. The number of red blood-corpuscles was 4,700,000 to the cubic millimeter, with about 11,000 white corpuscles in the same space. The estimation of the hemoglobin by means of Fleischl's hemoglobinometer gave a practically normal percentage. The red blood-corpuscles are very much crenated and irregular in shape, many of them seeming to be poorly developed. They also appear to contain small particles of pigment; but it is impossible to decide this point positively. Owing to the peculiar formation of the corpuscle the black spot may be due to refractive conditions. This latter theory seems probable in view of the fact that on dissolving the corpuscles with distilled water these pigment-spots also disappear.

Dr. Hansell, the chief of the ophthalmologic clinic, has kindly sent me the following report of the examinations of the patient that he has made. It will be noted that a tumor of the pituitary body might very readily produce the ocular symptoms:

$$V = R, \frac{20}{XXX}; L, 0.$$

There is *total atrophy of the optic nerve* of the left eye with paralysis of the superior oblique (?). The muscle involved is doubtful on account of absence of light-perception. The disc is white, with a shallow cup.

The optic nerve in the R. is pale, with a shallow cup, but not including the entire disc. There is a small spot of pigment in the retina in the upper and inner quadrant.

The R. pupil is normal in its reaction to light and to accommodation.

The L. pupil does not act alone, but only in harmony with the movements of the R.

The field of vision for white is concentrically contracted, more marked upward, downward, and to the temporal side than on the nasal side.

There is a slight central color-scotoma, most marked for green.

Some three weeks after the first examination, vision in the R. was reduced to $\frac{20}{XXX}$ partly, and the field of vision had contracted.

A UNIQUE CASE OF POLYPUS OF THE CERVIX UTERI.

BY HANNAH M. THOMPSON, M.D.,
OF WILMINGTON, DEL.

THE following case of cervical polypus has been under my observation for about twelve years. The past seven years I have had almost exclusive charge of the case. The patient is an unmarried woman, and was about thirty years of age at the first appearance of the polypus, or of the diseased condition that preceded its development. Previous to this there was a history of failing general health for several years, and for three or four years preceding the typical growth, local treatment had been resorted to for a congested and retroverted uterus, with cervical catarrh and endometritis.

The cervicitis and endometritis improved under treatment, but there was no permanent restoration of the displacement or of the impaired circulation.

The date of the first appearance of the polypus is not clear, on account of the difficulty of early diagnosis.

After wearing a Hodge pessary for several months, without other treatment, a change for the worse was ushered in by a profuse hemorrhage from the uterus.

There was also associated great constitutional prostration, and especially nervous and cerebral irritation. Upon an examination at this time, the cervix presented a nodular, purplish appearance, suggesting a forming abscess; the external os was soft and velvety; the lining membrane of the cervix was sensitive to touch, bleeding excessively when touched. There was no other appreciable lesion, either in the cervix or in the uterine body, with the exception of the retroversion. The hemorrhage persisted for several months, with but short periods of cessation, and in spite of various alterative and astringent remedies. Dr. Charles H. Thomas, of Philadelphia, then had charge of the patient, and to his kindness I am indebted for an early observation of the case while a student at the Woman's Medical College.

Suspicious that the growth was of a malignant nature, Dr. Thomas, at different times, called two or more distinguished gynecologists in consultation. Malignancy was ruled out, but no positive opinion was offered.

One specialist suggested varix of the cervix as a possible diagnosis. During one of these consultations, the cervix was incised laterally through what appeared to be a hemorrhoidal or varicose tumor. This threw no light upon the case, except to reveal a very vascular condition. The hemorrhage was alarming at the time, and continued greater than before the incision, with little intermission, for several weeks.

Within the sinus that remained after the incision, fungous growths or projections now sprang up from time to time. These appeared to be the source of the hemorrhage. It was at this time also observed that at certain periods there was a soft, pulpy growth protruding from the external os. Under Dr. Thomas's treatment the patient improved in general health, but the metrorrhagia and other typical features of the case were only temporarily alleviated.

In the latter part of 1888, the case came more directly under my care, and I had then the opportunity of a more careful study of its obstinate features. There was still metrorrhagia—not so profuse as in the beginning—but I found that it was *periodic*, confined to about a week or ten days of the intermenstrual period, and that the nervous disturbance was greatest at this time. The *periodicity* of the different features was so marked as to attract my attention from the beginning. I found that exactly two weeks from the beginning of the monthly period there was an intermenstrual cycle as follows:

A very appreciable softening of the cervix; a flow of blood varying in amount (the past two years often greater than the monthly flow); slow dilatation of the external os; and in a few days a protrusion from the external os of a polypus, generally not larger than a good-sized pea. Accompanying this there was regularly a decided constitutional paroxysm lasting a week or more. This consisted of excessive nervous irritability, insomnia, with throbbing and distress in the head so great that the patient feared it would affect her mind. There was no imagination about this, as her appearance indicated suffering and painful nervous strain. These reflex symptoms constituted the most distressing feature of the case, as they yielded little, if at all, to medication. They were out of all proportion to the local lesion or pelvic irritation, and entirely different from the ordinary nervous symptoms of the monthly period. After the polypus protruded, the nervous symptoms abated, without removal of the growth.

The polypus would remain *in situ*, bleeding more or less for four or five days. It would then shrivel up and disappear, leaving the cervix, to all appearance, in a natural condition. An examination at this time would disclose nothing abnormal but a retroverted uterus. The week before, as well as about ten days or two weeks after menstruation, no growth was discernible and but rarely any hemorrhage after its disappearance.

I found, as had Dr. Thomas, that strong applications of iodine, carbolic acid, chromic acid, as well as positive electricity, would destroy the growth and occasionally prevent its formation for the subsequent month, but there was no stamping it out entirely. Surgical methods were tried with but little better success. Not only thorough dilatation and curetting of the cervical canal and internal os were tried, but at one time the base of the polypus was cut out entirely, and the underlying surface cauterized with strong acid. I found the polypus was attached by a broad pedicle—it seemed almost to be a part of the *substance* of the cervix—to the lateral wall of the cervix, midway between the external os and the internal os.

After the above operation, there was no return of the growth for two months. There was, however, some bleeding at each intermenstrual period. There was also partial relief from the peculiar reflex symptoms, but so much prostration followed the operation that it was decided not to repeat it. The treatment has since been simply palliative.

The polypus or polypi, for it sometimes appeared as if there were more than one, has continued to appear and disappear as described, with almost unvarying regularity, for at least *ten years*. The retroversion, which was always an additional cause of suffering and probably the starting-point of the disease, could not, on account of adhesions, be entirely corrected.

There is now, I think, a promise of cure with the establishment of the menopause. The first intimation of this change, three months ago, passed by without menstrual or intermenstrual period, but in place nervous disturbances occurred indicative of the menopause. The following three months the menses appeared regularly, as well as the intermenstrual growth, larger than at any time previous. There is now again a period of rest from both, showing conclusively, I think, that the termination of the menstrual cycle will break up the curious intermenstrual phenomena of this case.

What, then, are the peculiar features of the case?

1. A regular intermenstrual congestive paroxysm, with decided local and constitutional symptoms and the development of a lesion, extending over a period of at least ten years.

2. The obstinate nature of the growth—returning over and over again after thorough removal.

3. Its shrivelling up and disappearance without interference, after four or five days of maturity, followed by closure of the os.

4. The reflex symptoms, fully illustrating the effect of pressure upon or irritation of sympathetic fibers, are peculiar in their character and severity.

I find the literature upon this subject is exceedingly meager, throwing but little light upon the pathology of such growths. Some authorities describe a species of vascular polypus formed from development of the blood-vessels. Thomas says these are probably only a form of the cellular or mucous variety.

Emmett's "mucous polypi developed from enlarged Nabothian follicles," conform to the appearances in my case, but he says they are generally present near the menstrual period, and though occasionally returning, are curable. These are frequently met with in practice and are not generally obscure or obstinate. Hart and Barbour, in their classification of polypi, describe a form anatomically distinct from the mucous variety and which they name "pediculated cystic follicles." They are the result of chronic catarrh of the cervix, are bluish-red polypoidal projections, formed from obstructed Nabothian follicles, and are often accompanied by metrorrhagia. In my case there is no doubt but that the disease and the growths were cervical in their origin, as on microscopic examination they presented the characteristic columnar non-ciliated epithelium of the cervix, besides dilated glands.

The question arises, as in the case of all polypi, whether they were the cause or only the result of the inflammatory change.

Dr. Howard A. Kelly, who saw my patient in consultation more than once, was especially interested in the case, as he is engaged in making a special study of these intermenstrual phenomena. Dr. Kelly advised a thorough application of the galvano-cautery as offering the surest method of cure. It was postponed on account of the patient bearing operations badly, but I was about ready to give it a trial when the hopeful prospect indicated came to our rescue.

ERYSIPELAS APPEARING IN THE COURSE OF PUERPERAL PYEMIA.

BY W. REYNOLDS WILSON, M.D.,
OF PHILADELPHIA.

THE following case illustrates the probable identity of the cause of pyemia and that of erysipelas. There has been much discussion upon this point, and the report of this case may add some weight to the facts that have already been collected. The question as to whether in the present instance the erysipelas was an accidental condition can be decided only by a careful study of the history of the case, which is as follows:

The gravida, a primipara, aged twenty-three, was first examined on the 23d of September, four weeks before the time of her confinement. The record of her pregnancy shows nothing unusual, except that during the last two weeks she complained so much of pain in the lower part of her abdomen and on either side during exertion that she was withdrawn from the work that had been assigned her in the domestic arrangement of the hospital. Her labor was natural, the first stage lasting seventeen hours, the second two hours, and the third, terminated without the aid of artificial compression, forty-five minutes. There was no unusual loss of blood and no rupture of the perineum. The child weighed 8¾ pounds.

On the second day after confinement the patient suffered from a chill that lasted twenty minutes, followed by the subjective symptoms of beginning infection. Objectively, the fundus of the uterus was found on a level with the umbilicus and the uterus flabby and tender. The lochia were suppressed. The patient was put on quinine and an intra-uterine douche of 1 : 8000 bichloride was given. The temperature remained elevated, and intra-uterine douches, preceded by vaginal douches of creolin, were ordered to be given three times daily, and the ice-bag was applied over the fundus. On the evening of the fourth day, the patient suffered from another severe chill, followed by the appearance of tympany and great tenderness in the lower part of the abdomen. The intra-uterine douches were discontinued, and flaxseed poultices were used in place of the ice-bag. The pain was relieved by opium suppositories. During the course of the next two weeks, the patient suffered from an attack of pelvic peritonitis, the temperature ranging about 104°. During this time, the uterus, on examination, was found well contracted and held by adhesions toward the right side, so that it presented a hard tumor occupying the right hypogastric region. This tumor corresponded to a resisting mass that filled the right vaginal vault. The os was directed toward the left and showed a diphtheritic membrane extending into the cervical canal. On the morning of the fourteenth day, after the administration of calomel, the tympany subsided and the temperature fell to 102⅘°. The patient's general condition, however, remained unimproved. At the end of the second week of illness, a swelling of the left labium majus, accompanied by pain and redness, occurred. This disappeared in a few days, and was followed by a circumscribed patch of similar appearance on the right shoulder. This latter area was sharply circumscribed. During the next few days, similar patches appeared upon the thighs and in the tibial region. Their appearance was sudden and accompanied by sharp pain. The temperature remained elevated, and the patient showed extreme exhaustion of the nervous system.

These areas of infiltration were attributed to pyemic emboli, which were confined to the subcutaneous tissue. An examination of the heart and lungs revealed no signs of pulmonary or endocardial affection the result of emboli.

On the evening of the twentieth day, after a gradual defervescence, the patient's temperature rose to 102°; at the same time a swelling of the lobe of the left ear was noticed. This swelling rapidly increased, involving the ear, the malar and palpebral regions, and assuming a reddish and then a deep-purple color. The edge of the infiltrated area presented a distinct zone of demarcation. The character of this area upon its first appearance naturally led to the conclusion that the same cause was here effective as in the erythematous patches of the subcutaneous tissue noted. But gradually the appearance changed to that of a frank, characteristic erysipelas, accompanied by the usual systemic manifestations. This

attack subsided on the sixth day, with resorption of the infiltration and disappearance of the discoloration. This area, as well as those first mentioned, after the disappearance of the swelling, was the seat of furfuraceous desquamation.

The course of this case is of great interest in its pathologic aspect. In the first place, the infection was probably active from the beginning, the localized peritonitis being the expression of a general process, and the seat of invasion being the endometrium. The form of infection was no doubt dependent upon septic rather than putrid poisoning. This is proved by the absence of necrotic endometrium in the washings from the uterus and of offensive odor of the lochia. These facts are in accordance with what is known of the processes of infection from the endometrium. These processes are divided, according to the description of Bumm, under three heads: Putrid, localized septic, and general infective septic. In the first two a limiting zone of small-celled infiltration cuts off the affected endometrium from the muscular layer of the uterus, while in the last two no such zone is present and the infecting germs find their way into the lymphatic system without the intervention of any reactive process. The general infection in this case was complicated by the dislodgment of septic thrombi, which found their way into the circulation, producing the pyemic condition.

It remains to discuss the etiology of the erysipelas. The similarity on the one hand between the erysipelas and the areas of embolic origin, considered as to the conditions under which they both appeared, lead us to infer that they were both due to the same cause. On the other hand, the extensive spread, the characteristic color and demarcation, and the course of the erysipelatous eruption warrant the diagnosis of true erysipelas. If we hold to the former inference, we would be adopting the more generally accepted view, namely, that of the identity of the streptococcus of erysipelas (Fehleisen) and the streptococcus pyogenes. The appearance, however, of the eruption upon the face instead of the genital region is contrary to this view, and might lead us to infer that the erysipelas was due to some other source of infection than that of the pyemia. This, however, is doubtful, as the history of the case shows that the patient before her confinement was not exposed to any source of infection, and the strict isolation that was observed during her illness made exposure after her delivery impossible.

PASSAGE OF A RENAL CALCULUS BY THE BOWEL.

BY I. W. GOOD, M.D.,
OF SPRING CITY, PA.

I WAS sent for on the morning of August 17, 1891, to see L. G., thirty-five years old, a married stove-mounter, of temperate habits. On my arrival I found the patient suffering from what he described as "cramps," from identical "spells" of which he had suffered frequently for quite a number of years.

The symptoms were those of renal colic, and indicative of the presence of the foreign body in the right ureter. The attack had set in three days previously, gradually increasing in severity. It had been noticed that the attacks were increasing in frequency, intensity, and duration, so that for some time the man had had in readiness opium in grain doses for the relief of the paroxysms.

The characteristic symptoms of the passage of a renal calculus were present: retraction of the right testicle; pain shooting from the right loin to the testicle of the same side and to the penis; considerable nausea; frequent micturition, with the escape of but a few drops of urine at a time. The pain was agonizing; the body was bathed in a profuse perspiration; the tongue was clean; the pulse between 56 and 60, soft and thready. There was no elevation of temperature; the bowels acted, the discharges being natural; the urine, on standing, deposited uric acid. The patient was measurably relieved by repeated hypodermatic injections of morphine.

Sodium benzoate was ordered in 15-grain doses, three times a day, with potassium bitartrate as occasion required to keep the bowels active and to favor elimination by the kidneys. Opium was given in grain doses every hour or half-hour, as required. The ingestion of liberal quantities of water and milk was encouraged. A warm hip-bath was ordered night and morning. The case pursued an uneventful course for several days, the patient not being entirely relieved. Thinking that possibly the manifestations might be malarial and neuralgic, several full doses of quinine sulphate were given, with the result of producing only the symptoms of cinchonism. As stated, the urine contained crystals of uric acid, but no blood.

The patient was able to arise from bed; the pain had somewhat abated; there was no elevation of temperature; the pulse ranged from 65 to 100; the appetite remained poor, and the tongue was heavily coated. Sleep could only be induced by opiates. At this juncture a tender spot, about one and a half or two inches in diameter, in the course of the right ureter, apparently near its entrance into the bladder, was detected, but no induration or redness was apparent. The patient was more comfortable with the right thigh somewhat flexed as he lay upon his back. The bowels were moved about every second day, and the stools were natural.

On the morning of the 29th I was hurriedly summoned, and found that the patient was entirely free from pain; the tenderness in the course of the ureter had in a great measure subsided; the man had enjoyed natural sleep during the night, and felt better in every respect; but he was alarmed by the character of his urine. On the morning of the previous day he had eaten a small piece of corn-fritter. His bowels were moved but a short time before he had sent for me, but unfortunately the stool was not accessible to inspection.

Shortly afterward he found that urination was obstructed, while there was a sensation of an accumulation near the urinary meatus; by straining and manipulation he at last expelled a grain of corn. The urine voided subsequently was found to have a horribly offensive odor and to contain fecal matter. Opium was ordered in sufficient quantities to check peristalsis, and in the hope of preventing the development of peritonitis. The patient was advised to lie on his back as much as possible, to reduce to a minimum the admixture of the contents of the intestine with the contents of the bladder, with the development of cystitis. An absolute milk diet was directed, and all excitement absolutely inter-

dicted. I was convinced that the calculus, by reason of its size, had become impacted in the ureter, which by adhesive inflammation had become attached to some part of the intestinal tract; subsequent ulceration had afforded the stone exit by the bowel.

I deemed it best to employ expectant treatment. The patient was much annoyed by frequent acts of micturition and by excessive tenesmus. The stools presented a urinous odor. For ten days more fecal matter continued to escape by the urethra. Opium suppositories and starch enemata were employed to allay the tenesmus. Following the enemata the urine responded to the tests for starch. Subsequently the urine became freer from fecal matter, though it contained pus and was highly ammoniacal. There were tenderness and irritability of the bladder, symptomatic of cystitis—for the relief of which sodium benzoate and turpentine were successfully employed. At the end of the third week of the symptoms of recto-ureteral fistula, the condition was in all respects much improved. At the end of the fourth week the patient sat up in a chair. For several weeks some tenderness persisted in the course of the ureter over the probable situation of the communication with the bowel. The evidences of such communication ultimately disappeared entirely.

MEDICAL PROGRESS.

Bronchiectatic Cavity due to Impaction of an Intubation-tube.—SUTHERLAND (*Lancet*, No. 3569, p. 188) has recorded the case of a man, seventeen and a half years old, in which, after a blow upon the neck below the chin, pain developed, with difficulty of swallowing. In the course of a week the temperature rose, the voice became husky, and breathing became noisy and embarrassed. Suffocative attacks set in, with cough and the expectoration of considerable frothy mucus. Laryngotomy was performed, but afforded only temporary relief, so that subsequently intubation was practised. During a paroxysm of coughing, the string attached to the tube broke and the tube passed into the trachea. Efforts to remove the tube were unsuccessful. For a time the patient did so well that it was thought the tube might have been swallowed and voided by the bowel, but subsequently the symptoms returned in an aggravated degree. During a violent attack of cough, the patient perceived a sensation as of a moving body in the chest. He could only occupy the dorsal decubitus. Evidences of the formation of a bronchiectatic abscess appeared, for the relief of which pneumotomy was performed, but without the discovery of the foreign body. The patient progressively grew worse and died after repeated hemorrhages. At the autopsy, the intubation-tube—two and a quarter inches long—was found in the left bronchus, where it had given rise to a bronchiectatic abscess. The lumen of the larynx was narrowed. It is conceived that the primary injury had involved the pneumogastric nerve and had also given rise to a traumatic laryngitis. For three months the intubation-tube had lain in the trachea, where its presence was tolerated, until during a violent paroxysm of cough, the tube became dislodged, entering the bronchus and giving rise to the subsequent train of symptoms and fatal issue.

Resection of the Stomach for Carcinoma of the Pylorus.—At a meeting of the Royal Society of Physicians of Vienna, v. HACKER (*Wiener klin. Wochenschr.*, 1891, No. 47, p. 888) presented a woman, twenty-five years of age, in whom eight weeks previously resection of the stomach had been performed for the removal of an obstructive tumor of the pylorus. The patient had for nine months complained of epigastric distress, accompanied by pain and aggravated by taking food, and of characteristic vomiting several hours after meals, with emaciation. The vomited matter contained sarcinæ, but no hydrochloric acid. The tumor was palpable in the epigastrium and left hypochondrium; it was apparently from two and a half to three inches in length; no nodules could be felt. When the abdomen was opened, it remained doubtful whether the mass was carcinomatous or cicatricial. Several enlarged glands were detected in the omenta, and careful inspection disclosed the presence of a number of miliary nodules on the apparently smooth anterior surface of the tumor. By tearing the small omentum with dissecting-forceps and introducing a finger behind the stomach, it was found that the growth was not adherent posteriorly. After the resection had been performed, the mucous surfaces were approximated by continuous sutures, the sero-muscular coat by interrupted sutures and a few Lembert sutures. The operation occupied two hours. The subsequent course of the case was undisturbed. In three weeks the patient was able to get out of bed; in four weeks she was dismissed. Following the operation she gained four pounds in weight. On microscopic examination of sections of the resected portion of the stomach and of one of the enlarged glands removed, the growth was found to be a glandular carcinoma.

Local Anesthesia.—At a meeting of the Berlin Medical Society, SCHLEICH (*Berliner klin. Wochenschr.*, 1891, No. 51, p. 1202) reported the successful performance of two hundred and twenty-four minor and major operations—including sequestrotomy, herniotomy, laparotomy, amputation of fingers, suture of the patella, radical treatment of hydrocele, extirpation of tumors, and nephrorrhaphy—by means of local anesthesia. It was found that but small quantities of cocaine were required for the induction of local anesthesia if considerable quantities of water were injected, so as to cause generous infiltration of the tissues. To obviate the pain of puncture, a spray of ether is first applied. The needle of a hypodermatic syringe is then introduced, parallel with the surface, beneath the papillary layer of the cutis, endermatically, and a small quantity (three or four minims) of a solution of cocaine (gr. $\frac{1}{10}$ to f℥j) injected. The procedure is repeated throughout the area to be operated upon, the little nodules formed mutually touching at their periphery. According to the depth of the proposed incision, layer after layer of tissue is treated in a like manner, even down to the periosteum, the bone, and the osteo-medullary cavity. A two per cent. solution of potassium bromide or of caffeine may be substituted for the solution of cocaine. The essential factor in the development of the anesthesia is the infiltration of tissue. The largest dose of cocaine required in any case in which it was employed was a little more than half a grain.

Cretinoid Idiocy with Pachydermic Cachexia.—At a meeting of the Medical Society of Hamburg, EISENLOHR *Deutsche med. Wochenschr.*, 1891, No. 47, p. 1293) presented a girl, fourteen years old, without hereditary or family predisposition, who, it was stated, presented no abnormality until she was seven years old, when it was observed that there was a retardation of mental and physical development, together with an increase in the volume of certain parts of the body. In the course of time, the sides of the neck, the face, the forearms, and the hands became thickened and enlarged; fatigue was readily induced; intellectual activity became dwarfed; digestion was deranged; vomiting occurred and constipation developed. The girl at fourteen appeared no larger than a girl of seven; the head was large and brachycephalic; the nose was flat; the extremities were ungainly; the abdomen was prominent; the tongue was thick; the hair was red and rough; the teeth were imperfect. The skin of the face and hands was tense and doughy, presenting an appearance resembling edema, but suffused. Soft masses were palpable beneath the skin of the neck and in the supra-clavicular regions. The thyroid gland could not be detected. The urine contained no albumin. The fontanels were closed. There were no hernias. Intellectual development was defective. The patient's extent of language was small. Her appearance, however, was not idiotic.

Successful Treatment of Suppurative Phlebitis of the Internal Jugular Vein and the Lateral Sinus.—PARKER (*Liverpool Medico-Chirurgical Journal*, No. 22, p. 44) has recorded the case of a man, twenty-five years of age, who for eleven years following an injury in the region of the left ear, presented symptoms of suppurative otitis media, with perforation of the tympanic membrane. Symptoms of suppurative phlebitis of the left lateral sinus and internal jugular vein, with double optic neuritis, developing, an incision was made in the mastoid and infra-auricular regions, and the mastoid process was opened. A clot was found in the facial and jugular veins, extending into the lateral sinus, which was occupied by greenish purulent lymph. Ligatures were applied to the veins on either side of the thrombi, and the intervening portions excised. The lateral sinus was partially scraped. Hemorrhage was controlled by a plug of antiseptic wax. The symptoms disappeared for two days after the operation; then the temperature rose to 103°. The wax plug, with some accumulated pus, was removed from the sinus, and the mastoid cells were irrigated. For nearly a week the temperature continued to oscillate between high figures, but finally subsided, the case ultimately progressing to a favorable termination.

THERAPEUTIC NOTES.

Benzol in Influenza.—ROBERTSON (*British Medical Journal*, No. 1621, p. 171) recommends the employment of benzol in the treatment of influenza—as he has likewise found it useful in the treatment of whooping-cough. The symptoms of the disease are speedily and favorably influenced, and pneumonia seems to be prevented. Benzol can be dispensed in capsules or in mixture, in doses of three minims for children and five minims for adults, every two or three hours. The following formula may be employed:

℞.—Benzol. pur.	. . .	♏lxxx.
Spts. vini rect.	. . .	f ℥ss.
Spts. chloroformi	. . .	f ℥iij.
Mucilag. tragacanth.	. ad	f ℥viij.—M.

S.—A dessertspoonful or a tablespoonful at a dose, to be taken in lemonade.

Tuberculin in the Treatment of Leprosy.—KALINDERO and BABES (*Revue de Médecine*, 1891, No. 10, p. 817) have reported the employment of tuberculin in the treatment of eleven cases of various forms of leprosy. They found that the general reaction set in about twenty-four hours after the injection. Sometimes a second and a third reaction followed on successive days. Rapid repetition of the injections was followed by cumulative action. In some cases of tuberculous leprosy, small doses were followed by intense and protracted reaction. Local reaction was slight or wanting; exceptionally, it was intense and extensive; it manifested itself by injection of the infiltrated areas and the slow formation of crusts, with desiccation; the general condition was improved, though weakness resulted.

Potassium Permanganate as an Antidote to Phosphorus.—At a meeting of the Royal Society of Physicians of Budapest, BOKAI (*Deutsche medicin. Wochenschrift*, No. 47, p. 1294), as a result of chemical investigation and experiments upon animals, commended from one-fifth to one-third of one per cent. solutions of potassium permanganate as an antidote in cases of poisoning by phosphorus. Phosphorus in the presence of potassium permanganate is converted into innocuous orthophosphoric acid in the stomach, with the development of manganese chloride. Poisoned dogs thus treated were saved; untreated dogs died. Even one per cent. solutions of potassium permanganate exerted no injurious effect upon the coats of the stomach.

For Sore-throat.—

℞.—Cocainæ hydrochlorat.	.	gr. viij.
Acid. carbolici	. . .	℥j.
Glycerini	. . .	f ℥iv.
Aquæ rosæ	. . ad	f ℥xij.—M.

S.—To be diluted with an equal quantity of water, and used alternately as a spray and gargle. WHITLA.

For Tapeworm.—One of the best remedies for the expulsion of tapeworm from the intestinal canal is the oleoresin of male fern. After the usual preparatory treatment by low diet and catharsis, two drams of the oleoresin of aspidium may be whipped up with the yolk of an egg and peppermint-water, and syrup added to make two ounces; the whole being taken in the morning, on an empty stomach; and, if necessary, followed by a purgative.

For Incontinence of Urine.—

℞.—Tinct. nucis vomicæ	. .	f ℥vj.
Ext. damianæ fl.	. . .	f ℥ijss.
Glycerini	. . q. s. ad	f ℥iv.—M.

S.—℥j three times a day, after meals, in a wineglassful of water. WHITLA.

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OF MEDICAL SCIENCE.

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SATURDAY, FEBRUARY 27, 1892.

THE RETAIL DRUGGIST.

FROM a widely-distributed advertisement we quote the following paragraphs taken from the *Druggists' Circular* for September, 1890:

"COUNTER-PRESCRIBING.

"In this and other States there are very stringent laws to prohibit counter-prescribing by druggists, and as our medical brethren have spies constantly on the lookout, and a number of arrests have been made, it is of the greatest importance that all pharmacists should be on their guard. There is, however, no law under which a druggist could be arrested or fined for selling a friend or customer what they called for, and in order to meet this difficulty a little book entitled *A Medical Manual for the Treatment of Simple Diseases* has been carefully prepared.

"This work, which is carefully arranged in alphabetical order, gives the patient all the information he would most likely ask the druggist for, and which the pharmacist is not now in many places allowed to supply orally.

"The publication of this useful and valuable book is one of the most important events in the drug trade that has transpired in many years."

Following this announcement, there are full directions as to securing the book at the rate of one cent each, the same retailing "at 25 cents, this price being so printed on it."

Now, it may be said that this is really so contemptible as to be beneath notice; that too much splutter has been made about the counter-prescribing of druggists; that the physician ignores the pharmacist's side of the question, etc. But taken in connection with other aspects of the drug business it may be answered that it is easy to make a mistake in the attitude of disdainfully ignoring such evidences of the degradation of a once noble profession.

Because, taken up in a large way and carefully examined, the multiple evidences of this degradation are but too painfully patent. The worse than commercialization of the standing of the retail druggist is a sorry fact. Here and there—one or two in every city, perhaps—there remains a druggist respecting himself, his own profession and that of medicine, who, refusing to turn his store into a "soft drink" saloon or junk-shop, preserves the tradition of better days and the isolation of dignity in distress. His smart neighbor, who has adopted the modernized fashion, smiles derisively at the old-fashioned way, and slowly crowds the antiquarian out of existence.

And the new-fashioned way—What is it? Nay, rather should we not ask, What is it not? To attempt an enumeration of the multiplicity of articles or classes of articles, the Noah's ark of odds and ends, would tire an auctioneer. The ten-thousand-dollar soda-water fountain is the *pièce de résistance*, fast progressing to the lunch and coffee counter, and to mysteries beyond the comprehension of the uninitiated. Queensware, bric-a-brac, and infinite *olla podrida*, dispute with patent medicines galore the places of honor. Find the prescription department if you can and dare!

Some time ago THE NEWS pointed out certain reasons why physicians should dispense their own medicines. The considerations then adduced looked only to the good of the medical profession and the duties of the physician to the patient. But observation of the position of self-degradation of the druggist emphasizes the advice. Certainly any protest of the druggist is summarily stopped by—

1. The common practice of counter-prescribing and the suspicion of sneak authorized by the foregoing quotation from the *Druggists' Circular*.

2. The farcical commercialization of the profession and the omnium-gatherum type of the modern fizz-water-buffet-tobacco-shop-queensware-jewelry-what-you-please drug-store.

3. The patent-medicine disgrace, in which crime against civilization the druggist has become a chief abettor and agent.

4. The adulteration and impurity of the drugs kept, as proved by the late investigations of the New York State Pharmaceutical Association.

There is another reason that will in the future continue more powerfully to hasten the downward progress of the druggist's calling as a learned profession. This is the gathering of the art of compounding drugs into the hands of the manufacturing chemist, and the resultant concentration of this function under the control of a few large firms. Machinery, centralization, systematization, and the progress of pharmacology, have made it possible to compound vast quantities of almost every conceivable prescription with an accuracy that is greater and at far less expense than is possible in the case of a single prescription for a single patient. The wholesale manufacturer, moreover, passes by and over the retail druggist, supplies the physician directly, and the physician, finding it to his own benefit as well as to that of his patient, will more and more supply his patient at first hand.

There may be sad disadvantages in the outworking of this tendency, and many serious questions and difficulties will doubtless arise. It is barely possible that the better class of pharmacists may refuse to follow the drift of tendency, and heroically stemming the tide, in part and to a certain extent, rescue their calling from threatened degeneracy. It is doubtful, however. Young men with the capacity and high-mindedness to uphold the elder tradition will hardly ship on a vessel so rotten-timbered and strained. Already the profession of pharmacy is considered but a temporary makeshift, a half-way house. The course in pharmacy lessens the regular medical course of study by one year. It would be interesting to know how many matriculants of medical colleges have first served in the drug-store.

OPENING OF THE INSTITUTE OF HYGIENE OF THE UNIVERSITY OF PENNSYLVANIA.

THE NEWS herewith presents its readers with the Address of DR. BILLINGS, delivered last Tuesday, at the opening ceremonies of the Institute of Hygiene of the University of Pennsylvania.

Whether intentional or not, there was a subtile and genuine significance in choosing February 22d as the day for inaugurating the Institute. In its final analysis and outcome, Democracy, of which the United States is certainly the champion and example, must mean health. That, of course, means health for all, because, as science now well knows, there can be no certain and enduring health for any class or any person unless the health of the lowliest and the remotest citizen of the country —nay, of the world—is also assured. No science better than medicine illustrates and proves the great doctrine of the solidarity of the human race. Politically, that is the lesson of democracy, and it therefore argues well for us that so early in our country's history, by boards of health—municipal, State, and national—and by institutes of preventive medicine, we are manfully grappling with our tasks and duties to our fellow-men, present and to come. At first blush it would seem a shame that, as a community, we do not recognize the obligation, but stupidly wait for private generosity and institutional self-sacrifice to do that which Government should long since have done. DR. BENJAMIN LEE ironically referred to this sad aspect of the matter, the aristocratically governed peoples of Europe being protected by a thousand wise safeguards against adulteration of foods, pollution of water, etc., and enjoying myriad hygienic advantages over ourselves. But it should not be forgotten that as yet we are only experimenting with civilization and government, that, intoxicated with our own youth and surplusage of strength, we leave the rascals to cultivate the art of plunder, instead of attending ourselves to the serious art of governing. If, in this mood, every city and State had a laboratory of preventive medicine, Hygeia would probably soon become a very leprous goddess. The political boss and the scientist would be a very mismatched pair. For a considerable time we must yet await the recognition, on the part of the public, of its duty both to preventive medicine and to itself, and also the possibility of successful realization of any practical work in that field. The great difficulty in getting the paltriest appropriation from the politicians proves how far we still are from communal action. In the meantime, all discriminating minds should help pay the debt of gratitude the City, State, and Country owes to the nobly beneficent men who have presented the people with such a Laboratory, and to the great educational institution that guarantees its work and future usefulness. A fuller endowment is still needed, and more important even than endowment is coöperation and practical helpfulness on the part of all.

THE MUTUAL AID ASSOCIATION OF THE PHILADELFHIA COUNTY MEDICAL SOCIETY.

NONE that will read these lines can be ignorant of how precarious is the professional income of medical men, and how few are the opportunities of accumulating money in medical practice. Many will be able to recall the cases of practitioners that during life had labored arduously and, removed prematurely or in old age by death from the midst of their families, had left those that had been dependent upon them without adequate means of support. Recognizing these facts, associations have been organized in England and in the United States with the object of providing for indigent widows and children of deceased medical men, as well as for such physicians as by accident or adversity have lost their own means and powers of support. In the spirit of this movement and with these nobly philanthropic motives has the Mutual Aid Association of the Philadelphia County Medical Society been organized. As the president of the Association has well said, membership constitutes not insurance, but charity. It is hoped to establish a permanent fund of a hundred thousand dollars to be derived from the philanthropic, both within and without the medical profession. Members of the County Medical Society may become members of the Mutual Aid Association by paying an initiation fee of five dollars and an annual fee of five dollars for ten years or ten dollars for five years; by paying fifty dollars in one sum they become Life Members. Anyone that pays a hundred dollars becomes a Benefactor. In suitable cases, as soon as a sufficient fund has been accumulated, an annuity of four hundred dollars will be paid to the widows of members and one hundred dollars to each child. The Association is most economically conducted. It has practically no expenses. All of its income is devoted to the Permanent Fund. Every physician should indorse the work of the Association by at once becoming a member or by contributing directly to the Permanent Fund. The general community can in no better way testify to its appreciation of the labors of a self-sacrificing profession than by meeting with a full and generous response its appeal for funds in a noble cause.

The members of the profession in every part of our country should establish similar societies.

In evidence of the practical working of the movement under consideration we refer to the report presented at the annual meeting of the subscribers to the British Medical Benevolent Fund, held in January, according to which, during the year 1891, nearly $9000 was distributed in grants among 159 persons and a like sum among 99 annuitants.

MEDICAL SOLIDARITY OF THE RACE.

PHILOSOPHERS and moralists have long been in the habit of emphasizing the great fact that the life of the world is a unit, and that all biologic facts and phenomena are mutually interdependent. The profundity and reality of the truth have been obscured by the vagueness of the generalization. Civilization has often given convincing examples of the fact, but there is none more striking than the conveyance of contagium along lines of travel. Before the development of the marvellous means of quick intercommunication, there was less danger of the transfer of disease-germs than now, when localization of disease of any kind grows more and more difficult. That we have to become responsible for disease generated ten thousand miles from us, among people whose national names and languages sound most strange to our ears, is a fact that comes vividly before us as we consider the typhus fever pest brought to our homes by the poor Russian refugees. One steamer alone has sown ninety-six cases of typhus among our Eastern cities. The greatest energy and severest caution are demanded. The physiologic sins of these far-away folk are visited upon us. We at once become interested in the most lively way in the social and economic life of an oriental and semi-barbarous people. It becomes our duty and self-interest to see to it that the bad life *there* is made more healthy and normal, in order that the better life *here* be not morbidized.

It also cannot be held an unjustifiable extension of the thought that the application of the principle of the solidarity of the human race is not limited to aspects simply physiologic or pathologic. Pathology and pathogeny are preaching the preacher's text more powerfully than he could prophesy or foresee. The brutal edicts of Tsars and race-hatreds forcing famishing men to cast themselves by thousands upon our shores, bringing with them malignant disease to scatter broadcast amongst us, are also consequences flowing from other factors than physiologic ones. We become interested in lessening those governmental, aristocratic, and irreligious deviltries that make up much of what is ironically termed Russian civilization. Whether by huge portfolios of petitions, by magazine publications, or

by the persistent effect of national diplomacy and influence, democratic America is vitally concerned in curing, civilizing, and democratizing sick, barbaric, and tyrannized Russia.

IN NEW YORK

THEY have a medical periodical, *The Post-Graduate*, the anonymous editor of which is deeply interested in his own "great medical discovery ignored," consisting in the important pathogenic fact that at the very finest restaurants of New York the cooking is bad, the table and food poorly served, etc.; just around the corner more "toothsome" food is to be had. In this and other medical matters the editor breathlessly seeks to be pert rather than pertinent, curt rather than courteous, and he evidently is thoroughly satisfied with his success. His devotion to the interests of the medical profession is shown by a defence of the hospital-charity abuse, and his knowledge of medicine by the ludicrous assertion that a mydriatic is not at all necessary for the accurate estimation of errors of refraction; the use of a mydriatic, he asserts, being an "ancient practice."

It is the commonest experience of the ophthalmologist that his patients remain strangely unconscious of high degrees of astigmatism and ametropia. How frequently likewise we stumble on the analogous illustration of mental astigmatism, emotional myopia, moral strabismus, or other like sorry type of psychic ametropia, amblyopia, or restricted field —all with delicious innocence of incongruity; in the same way that humor is most perfect when the comic source is self-confessedly most serious and goes about with most gothically arched eyebrows.

But in New York, as we know, they have also many sincere men and good physicians; from them, if desired and if possible, the excellent lesson might be learned that flippancy is not irony, that conceit is not good manners, and that, exceptionally, post-graduate wisdom may be undergraduate nonsense. This is also "*very, very true.*"

In sword-lore there is a legend of a blade so fine and so sharp that, with a good blow, a man's head could be severed from his body and not be displaced, and the man remain in ignorance of the fact—so long as he kept right still and did not cough. It would seem that fatuous superciliousness may clumsily perform hari-kari of this peculiar and extreme kind in ignorantly attempting to wield the dangerous weapon of modern medical criticism. We write with the kindliest intent, and only to caution our hari-karicaturist that after such superb swordsmanship there is great danger in coughing.

SELECTION.

TYPHUS FEVER IN NEW YORK.

THE most serious outbreak of typhus fever that has occurred in the country for many years, became known to the health authorities of New York late on the night of February 11th, and on the following day no less than fifty-eight cases of the disease were discovered. On January 30th the French steamer "Massilia," of the Fabre line, arrived with 717 steerage passengers. Two hundred and fifty of these were Russian Hebrew immigrants who were aided by funds provided by Baron Hirsch, and they were first transported from Odessa to Constantinople, whence they hoped to be able to go to Palestine and settle. Being disappointed in this, through the action of the Turkish authorities, they came to Marseilles, where they embarked on the "Massilia," together with a considerable number of other immigrants of various nationalities. The steamer on January 1st took on board more than 200 Italians, and on January 12th she sailed from Gibraltar. On the ship's arrival eleven passengers were ill, three of them with what was believed to be typhoid fever, but which, as the sequel shows, was undoubtedly typhus.

On the day following, February 12th, eleven additional cases were discovered among the Russians. Every effort was made to trace the Italian and other immigrants who came on the "Massilia," but it was found that many of them had left the city. On February 13th, five additional cases of typhus were found among the Russians from the "Massilia;" February 15th, seven more cases; February 16th, six cases at Oakdale, Mass.; and each day is adding to the list. There are, at time of writing, eighty-nine cases at North Brothers Island.

The whole country is more or less alarmed and disturbed, and really in a certain measure endangered by the living freight which this steamer has been allowed to land upon our shores after it had been refused the hospitality of the intelligent Turk.

We have thought it worth while to put together the main facts in the case as an illustration of the daily folly which we, as a nation, are permitting to be committed in the beautiful name of freedom, to the relief of other countries, the profit of a lot of steamship companies, the gradual degradation of our population, and the positive diminution in the safeguards for life, liberty and the pursuit of happiness which those already living here would like to be assured of. We open our doors to squalor and filth and misery—which mean typhus fever—and we admit leprosy, almost as if these things were blessings in disguise.

The reports of the Treasury Department show that for the last six months of 1891 the number of immigrants coming from Russia (Poland excepted) in those months was 46,710, as against 20,934 in the corresponding months of 1890. The whole number of immigrants was greater in 1891 than in 1890 by about 100,000, and

nearly half of this increase is ascribed in the reports to Russia and Poland.

As sanitarians, with this text before our eyes, we desire to add our indignant protest to that expressed by the eminent statistician, Gen. Francis A. Walker, in a recent lecture against the results of our immigration laws. There are times when charity should begin at home.—*Boston Medical and Surgical Journal.*

CORRESPONDENCE.

CHICAGO.

Dr. W. M. Tomlinson—Improvements in the Northwestern University—The Alexian Brothers' Hospital—New Laboratory of Rush Medical College—Dr. Bayard Holmes on Infectious Filth Diseases.

DR. W. M. TOMLINSON, Registrar of Vital Statistics in the City Health Department, has resigned that position after seven years' service, to devote his entire time to the practice of medicine. Dr. Tomlinson was appointed by Mayor Harrison in his last term, and was so efficient in the discharge of his duties that he has stayed through Republican and Democratic administrations until the demands of his private practice have compelled him to give up his official position.

Many new buildings are needed for the various departments of the Northwestern University. The medical and pharmaceutical departments are to be the first schools favored with a new structure. The plans for a $100,000 building have been accepted by the board of trustees of the university, and when the Fall term of 1892 commences the structure will be ready for occupancy.

The site of the new building, which will be occupied by the medical and pharmaceutical departments, is located on Dearborn Street, sharing the block of 450 feet between Twenty-fourth and Twenty-fifth Streets with the new Wesley Hospital. The plans are for a structure of stone and brick, 110 by 105 feet ground dimensions, and its four stories and basement will make a total height of 75 feet. The entire department of pharmacy will be quartered in the new place, and all the laboratories of the School of Medicine will be situated here. At present the University Medical School is located at the corner of Prairie Avenue and Twenty-sixth Street. This building is to be remodelled, and the school will continue to use it for college purposes after the completion of the Dearborn Street building.

The twenty-fifth annual report of the Alexian Brothers' Hospital shows 2109 patients admitted to the hospital in 1891, and 1408 sent out as cured. Only 150 patients died. A large amount of charity work was done during the year, there being 827 charity patients treated. Dr. A. J. Baxter, of the surgical department, has retired; and Drs. F. Henrotin and J. B. Murphy have been appointed surgeons. Drs. J. H. Hoelscher and F. W. Rohr have been appointed to duty in the medical department.

Rush Medical College is to have a biological and pathological laboratory, to cost $50,000. The faculty has raised the necessary funds, and the laboratory will be built during the coming summer, and be ready for occupancy in the Fall. One of the most important departments in the laboratory will be the department of bacteriology. One of the faculty stated that the position of director of the laboratory would be filled by a well-known European bacteriologist. At a recent meeting of the faculty replies to letters sent out to famous European specialists inviting them to suggest some celebrated bacteriologist for the place were read. From the names suggested the faculty will, at a subsequent meeting, select a man who has a world-wide reputation. The bad sanitary conditions in many of the large cities long ago demonstrated the wisdom of making the study of bacteria a feature of the course at Rush, and the bad sanitary condition of Chicago was one of the reasons urged for the establisment of the laboratory and a professorship of bacteriology.

Dr. Bayard Holmes, in a recent lecture before the Evolution Club on "The Evolution of Disease," said: "The infectious filth diseases are the most destructive diseases that man is heir to. Of all these filth diseases we are perhaps most interested in typhoid fever. Typhoid fever is due to a bacillus, rather shorter and thicker than the bacillus of tuberculosis. The microorganism lives readily upon all kinds of filth, animal and vegetable material, and even in water which contains a small amount of dissolved organic substances. It has been found in drinking-water and in ice, and when it grows in sufficient abundance it gives off a by-product called nucleine, which, when taken into the system, after the microbe itself has been killed, produces a transient form of the typhoid disease.

"Diphtheria is due to a bacillus that is found only upon the mucous membrane of man and the lower animals. It is saprophytic or putrefactive in that it grows readily upon all nutrient material, such as potatoes, bread, paste, and gelatin.

"Cholera is a filth disease due to the invasion of the body by a bacillus which resembles the other putrefactive bacteria. The cholera-germ grows readily in or on animal or vegetable matter, and in water that contains only a small amount of organic substance in solution.

"Malaria is due to infection of the blood with a living animal parasite called the plasmodium of malaria. It belongs to the order protozoa. This parasite inhabits the circulating blood, and can be seen moving about in the red blood-corpuscles themselves at certain times in the course of the disease. This organism has not been grown on any artificial culture media, though it is supposed to be an inhabitant of marshes and wet, undisturbed soil. There are a number of other filth diseases —cholera infantum, for example—but it is tiresome to hear of so many. They are all alike in being due to the infection of the tissues of the body, or the invasion of the organs of the body, by microörganisms that lead lives wholly independent of man, or live only partially dependent on man as a messmate. That is to say, they are due to organisms not necessarily parasites. If man insists on drinking out of his cesspool or catch-basin he will expose himself to yellow fever in Vera Cruz, to cholera in Calcutta, to malaria in New Orleans, and to typhoid fever in Chicago.

"In regard to the prevention, extermination, and amelioration of the suffering from these diseases the evolutionist and philosopher has much to say. The chronic

infectious diseases can be exterminated by an understanding of their origin, their source and method of contagion, and proper segregation of those invaded by the parasite. The vaccination of Jenner points to the remedy for the acute infectious disease. The filth disease, the concomitants of an imperfect civilization, will be exterminated by education and by cleanliness. In our grandfathers' day the itch went around every winter. It was a theme of polite conversation a few years ago. They spoke then of having the itch as we speak of having typhoid. It will soon become as embarrassing to say, 'I have just recovered from an attack of typhoid,' as it was to say, 'I am just getting rid of the itch.' As the family was the unit that perpetuated and exterminated the itch, so is the community the unit that perpetuates and must exterminate the filth diseases.

"It is possible that all the existing diseases are not yet recognized by the medical profession, but none not now existing will ever persecute man. Among the filth diseases, however, new diseases may arise. In the enormous accumulations of filth in the lake, extending a mile out and up and down the shore for twenty miles opposite this city, growing a few inches deeper year after year from the deposit of our enormous sewerage, some predominant saprophytic microörganism producing a very noxious ptomaïne may become partially parasitic, as the typhoid bacillus has, and give rise to a new disease endemic. If we can afford to have one or two thousand die in our city each year of typhoid, and about five or six times as many sick for two months each, we can afford to continue to pile up this filth in the bottom of the reservoir of our water-supply. There was a time in the history of the city when the doctors claimed that the wells were contaminated with typhoid, and urged that they be closed. Again those fanatical fellows besought the honorable guardians of the city's health to stop taking water from the river and from the lake at the foot of Randolph Street, and now some suggest that pure water cannot be obtained long even at the four-mile crib if the sewers are allowed to empty their contents into the lake.

"Let us stop our hysterical emotions and sit down and think. If a little education will exterminate the chronic infectious diseases, and education and cleanliness the filth diseases, let us go to work to educate the people. If the pests of childhood, the acute infectious diseases —scarlet fever, measles, and whooping-cough—can be ameliorated and practically exterminated by some form of preventive inoculation, let our benevolent people stop building hospitals and libraries for a year or two and build some laboratories for the study of preventive inoculation. The day is not far distant, in my opinion, when the acute infectious diseases will be exterminated; when a terminating inoculation will be practical for tetanus, diphtheria and pneumonia; when a great city will cease to make a cesspool of its water-supply and will spend less for its department of charities than for its department of health. The age of emotion will merge into the age of reason."

Orchitis following Influenza.—BRISCOE (*Lancet*, No. 3569, p. 192) reports the case of a laborer, thirty-two years old, in which, after an attack thought to have been influenza, orchitis developed, without other complication.

REVIEWS.

THE PRINCIPLES OF BACTERIOLOGY: A PRACTICAL MANUAL FOR STUDENTS AND PHYSICIANS. By A. C. ABBOTT, M.D., First Assistant, Laboratory of Hygiene, University of Pennsylvania, Philadelphia. With illustrations. 8vo, pp. 263. Philadelphia: Lea Brothers & Co., 1891.

AMERICA has realized that the science of bacteriology is established upon a permanent basis. The evidence of the fact consists, not in the acceptance of the germ-theory of disease, but in the organization of departments for instruction in the methods of bacteriologic research. With this advance comes the necessity for suitable text-books, of which there are already numerous good ones, both in English as well as in foreign languages; but each teacher has some peculiar method of exposition, and finds that he can best reach his pupils if, in addition to his personal teaching, he can place in their hands a book of reference, so that the practical demonstration may be supplemented and fortified by liberal reading.

Dr. Abbott has succeeded in preparing a work which, though elementary in character, will adequately meet the requirements of the laboratory student and of the general practitioner who desires an intelligent familiarity with the subject. A course of a month or eight weeks in the laboratory will not make a bacteriologist. General principles, however, can be learned, and with these the general practitioner should be conversant.

Dr. Abbott wisely directs that the solutions of the anilin stains should, in general, be recent. It has not been our experience, however, that the carbolized fuchsin solution decomposes readily. On the contrary, we have no difficulty in successfully staining tubercle-bacilli with solutions several months old. We have found the method described by Gabbet as the simplest of application for staining cover-glass preparations of sputum—staining with carbolized fuchsin and decolorizing with a 25 per cent. solution of sulphuric acid containing a small proportion of methylene-blue. No alcohol enters into the process and the risks of decolorizing tubercle-bacilli are reduced to a minimum. Of experimental inoculation of animals, only the subcutaneous and intravenous methods are considered; reference to inoculation of the eye, of the serous cavities, by the digestive canal and by the respiratory tract is omitted. Illustrations of the more common and accepted pathogenic microörganisms might judiciously have been presented.

Dr. Abbott's book will prove a useful aid to those that desire a knowledge of the principles of bacteriology.

We append a letter received from Dr. Abbott that is self-explanatory:

To the Editor of THE MEDICAL NEWS,

SIR: If you can afford me the necessary space in your journal, I would like to call attention through its columns to several errors of omission that I find in my book, *The Principles of Bacteriology*, recently published by Lea Brothers & Co., of this city.

A number of methods of work as described and recommended in that book have, to the best of my knowledge, been developed in the pathological laboratory of

the Johns Hopkins University and Hospital, where I was formerly assistant, but I discover that in the haste of preparation I have failed to mention this fact in either the preface or body of the book. As some of these methods have never been described before, I think it only just that the men who originated them should have credit for their work, and I take this means of correcting what I consider a serious omission on my part.

For instance, on page 68, the method for the preparation of potatoes for cultivation in the test-tube was devised by Dr. Meade Bolton, while assistant in the above-mentioned laboratory; on page 88 the modification of Esmarch's method which consists in rolling the tube on a block of ice instead of in iced water, as Esmarch recommended, was first employed by Dr. W. D. Barker in that laboratory in 1887; the "acetic acid method" for staining the capsules surrounding certain bacteria (page 133) was suggested by Professor Welch. The suggestion in regard to movable false-bottoms for the hot-air sterilizers, with a view to economy and convenience (page 47); the employment of rosolic acid in cultures of growing bacteria as an indicator for the reaction produced by the bacteria (page 75), and the preparation of needle-points for the intra-vascular injections into the vein of the ear in rabbits (page 155), are my own.

In addition, it was in the same laboratory that Esmarch's statement that "agar-agar is not adapted for tubes which are to be called after his method" was demonstrated to be erroneous, and it was also there that the hot-water funnel was abandoned, and the ready and satisfactory method for the preparation of nutrient agar-agar, as described in my book, was developed.

It is true that laboratory methods of work are usually considered common property, and so they should be; but, as is well known, every laboratory has certain technical devices of its own, which may or may not be employed elsewhere, and which are believed by those using them to give the best results. Fundamentally, the technique given in *The Principles of Bacteriology* is that common to most bacteriological laboratories, but still there will be seen here and there through the book certain deviations from the prescribed rules, which are followed in the Baltimore laboratory, and which are believed to be of advantage in the proper performance of this work.

Most respectfully yours,

A. C. ABBOTT.

LABORATORY OF HYGIENE,
UNIVERSITY OF PENNSYLVANIA.

THE MICROSCOPE AND ITS REVELATIONS. By the late WILLIAM B. CARPENTER, C.B., M.D., LL.D., F.R.S. Seventh Edition: in which the first seven chapters have been entirely rewritten and the text throughout reconstructed, enlarged, and revised by the REV. W. H. DALLINGER, LL.D., F.R.S., etc. With twenty-one plates and eight hundred wood engravings. Philadelphia: P. Blakiston, Son & Co., 1891.

A BOOK that has passed through six editions, carries its own commendation with it. So many important changes have, within recent years, taken place in the department of microscopic research that to keep abreast of the times revision and addition became imperative. As a result of this revision and additions, the work before us is practically a new one. Great credit is due the editor for the masterly manner in which he has handled his subject and made a homogeneous whole of a vast mass of facts of diverse character. All that pertains to practical microscopy is here to be found expressed in clear and forcible language, profusely illustrated by a large number of well-executed cuts and plates.

That portion of the work that most interests the medical man—the study of normal and abnormal tissues and fluids of the human body, including the various pathogenic microörganisms and the differential modes of staining them—is deficient in some respects. We realize that a book on the microscope cannot well be also a work on histology, a work on pathology, and a work on clinical medicine; but such a book would have enhanced value if it dealt, if only in a general way, with subjects of which a knowledge essentially depends upon the employment of the microscope. Thus, there is no word of tube-casts in urine; nowhere do we find even the name trichina or actinomyces, while page upon page is devoted to the consideration of certainly less important animal and vegetable organisms.

Ten pages are devoted to schizomycetes, but we fail to find mention of the vibrio of cholera or of the spirillum of relapsing fever. Many pages are taken up with descriptions of the protozoa, but not a word is said of a malarial parasite.

Despite these rather exacting criticisms, the book remains a valuable source of reference, especially for the naturalist. It will also afford much useful information to all interested in the mechanism and employment of the microscope.

SAUNDERS'S POCKET MEDICAL FORMULARY. With an Appendix containing Posological Tables, Formulæ and Doses for Hypodermatic Medication; Poisons and Their Antidotes; Diameters of the Female Pelvis and Fetal Head; Diet List for Various Diseases; Obstetrical Table; Materials and Drugs Used in Antiseptic Surgery, etc. By WILLIAM M. POWELL, M.D. Philadelphia: W. B. Saunders, 1892.

ANY means calculated to impress the undergraduate, or the post-graduate, with the idea that medicine, and the art of therapeutics in particular, is to be learned from formulæ must be regarded as pernicious. Formularies as a part of text-books are objectionable enough, while there can be no legitimate excuse for the production of a work devoted solely to the presentation of pharmaceutical formulæ.

Therapeutics is an art, not a trade, the successful application of which depends upon an intelligent comprehension of the relation between pathological processes and the physiological actions of various medicinal agents, and not upon the mere mechanical administration of drugs, of which one is selected for the individual symptom, symptom-complex, or disease.

More harm is done by the blind employment of medicines than by their judicious withholding. In a given case more depends upon wise management than upon perfunctory prescriptions. What is now needed is a work directing the uninformed when not to give medicine.

That practitioner who cannot acquire a working knowledge of the practice of medicine without the employment of ready-made formulæ had better surrender his diploma

and take up some other mode of occupation for the successful engagement in which the broadest possible intelligence is not absolutely requisite.

A PRACTICAL RÉSUMÉ OF THE MODERN METHODS EMPLOYED IN THE TREATMENT OF CHRONIC ARTICULAR OSTITIS OF THE HIP. By CHARLES STILLMAN, M.D., Chicago. Detroit, Michigan: George S. Davis, 1891.

IT is well that the author of this work should state that it has been compiled from the writings of other orthopedic teachers, since it is made up almost entirely of extracts. It deals with the treatment of hip disease only from the narrow standpoint of a specialist, who seems to think that the sole treatment for this form of ostitis consists in the employment of some form of apparatus. A number of splints are described, but no general plan or outline of treatment is given, nor is there anything in the book to guide a practitioner even in the selection of an apparatus.

The book necessarily deals meagerly even with methods, but we think that some of the authorities named, Willard or Gibney for instance, would be very unwilling to have it considered that a splint occasionally used by them should be looked upon as "their treatment of hip disease." One of these writers, for instance, is quoted as employing this splint, when the publication from which the extract is taken distinctly states that it is chiefly used in non-inflammatory cases and in the later stages of the disease.

As a catalogue of apparatus rather than as a plan of treatment, the book is convenient; otherwise it is of little service.

NEWS ITEMS.

The Medical Association of Georgia will hold its forty-third annual session at Columbus, Ga., on April 20th, 21st, and 22d. Dr. G. W. Mulligan, of Washington, Ga., will preside. DR. DAN H. HOWELL, of Atlanta, Ga., is the Secretary.

The "Physician and Surgeon" of the January issue appears enlarged and improved. It, however, makes the mistake of printing advertisements in the context and interleaving advertisements among the reading matter.

Mütter Lectureship of the College of Physicians of Philadelphia.—The next course of ten lectures under the bequest of the late Prof. Thomas Dent Mütter, M.D., LL.D., "On some Point or Points connected with Surgical Pathology," will be delivered in the winter of 1893–94 before the College of Physicians of Philadelphia. Compensation, $600. The appointment is open to the profession at large. Applications, stating subjects of proposed lectures, must be made before October 15, 1892, to WILLIAM HUNT, M.D., Chairman of the Committee on Mütter Museum, Thirteenth and Locust Streets, Philadelphia, Pa.

The Opening Ceremonies of the Institute of Hygiene of the University of Pennsylvania were held in the Library of the University at the Opening, February 22, 1892. These consisted of: Prayer—By the Rev. Dr. George Dana Boardman. Presentation of the new building to the Provost and Trustees—Dr. S. Weir Mitchell, Chairman of the Committee on Hygiene. Acceptance on behalf of the Provost and Trustees—Provost William Pepper. Address—Dr. Benjamin Lee, Secretary of the State Board of Health. Address—Dr. John S. Billings, Director of the Institute. Address—Dr. H. P. Walcott, President of the Massachusetts State Board of Health.

The Pan-American Medical Congress in New York State.—At a meeting of the Medical Society of the State of New York, at Albany, February 5th, a committee was appointed to coöperate in promoting the interests of the Pan-American Medical Congress. The committee consisted of Drs. A. Walter Suiter, A. Vander Veer, James D. Spenser, Seneca D. Powell, W. W. Potter, D. B. St. John Roosa, and John O. Roe.

BOOKS AND PAMPHLETS RECEIVED.

Botany: A Concise Manual for Students of Medicine and Science. By Alex. Johnstone, F.G.S. New York: D. Appleton & Co., 1891.

Surgical Anatomy for Students. By A. Marmaduke Shield, M.B. Cantab., F.R.C.S. New York: D. Appleton & Co., 1891.

The Prescribers' Pharmacopeia. Second Edition. Bombay: Kemp & Co., Limited.

The Treatment of Appendicitis. By J. B. Summers, Jr., M.D. Reprint, 1891.

Tobacco, Insanity, and Nervousness. By Dr. L. Bremer (Druggist). Pamphlet. St. Louis, Mo.: Meyers Bros.

Record-book for Physicians and Trained Nurses. Philadelphia: P. Blakiston, Son & Co., 1891.

Gymnastic Exercise as a Prophylactic and Curative Remedy in Chest Diseases. By Edward O. Otis, M.D. Reprint, 1891.

Puerperal Eclampsia. By J. T. Graham, M.D. Reprint, 1891.

Guaiacol in the Treatment of Tuberculosis. By Prof. Max Schueller, of Berlin, Germany. Reprint, 1892.

Manual of Operative Surgery. By Frederick Treves, F.R.C.S. Two volumes, with 422 Illustrations. Philadelphia: Lea Bros. & Co., 1892.

First Lines in Midwifery. By G. Ernest Herman, M.B. Lond., F.R.C.P. Illustrated. Philadelphia: Lea Bros. & Co., 1892.

Surgical Diseases of the Ovaries and Fallopian Tubes, Including Tubal Pregnancy. By J. Bland Sutton, F.R.C.S. With 119 Engravings and 5 Colored Plates. Philadelphia: Lea Bros. & Co., 1892.

Dictionary of Treatment, Including Medical and Surgical Therapeutics. By William Whitla, M.D. Revised and Adapted to the Pharmacopeia of the United States. Philadelphia: Lea Bros. & Co., 1892.

Notes on General *versus* Local Treatment of Catarrhal Inflammations of the Upper Air-tract. By Beverley Robinson, M.D. Reprint, 1891.

A Case of Orbital Cellulitis and Primary Mastoiditis Interna, etc. By Charles Zimmerman, M.D. Reprint, 1892.

Poliomyelitis with Perineuritis. By J. T. Eskridge, M.D. Reprint, 1891.

Tumor of the Brain. By J. T. Eskridge, M.D. Reprint, 1892.

The Treatment of Typhoid Fever. By James Barr, M.D. Introduction by W. T. Gairdner, M.D., LL.D. London: H. K. Lewis, 1892.

Lessons in the Diagnosis and Treatment of Eye Diseases. By Casey A. Wood, M.D. Physicians' Leisure Library Series. Philadelphia: George S. Davis, 1891.

External Perineal Urethrotomy. By W. B. Rogers, M.D. Reprint, 1891.

Poverty Superseded: A New Political Economy. A Paper on Economic Science. By A. P. Reid, M.D.